APRIL 15, 1960
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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

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By John S. Reed

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By Allan R. Stacey

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By Richard Allen

REDUCING TRUCK OPERATING COSTS
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OFF-THE-JOB SAFETY
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BUILD YOUR OWN ANNOUNCEMENT SYSTEM
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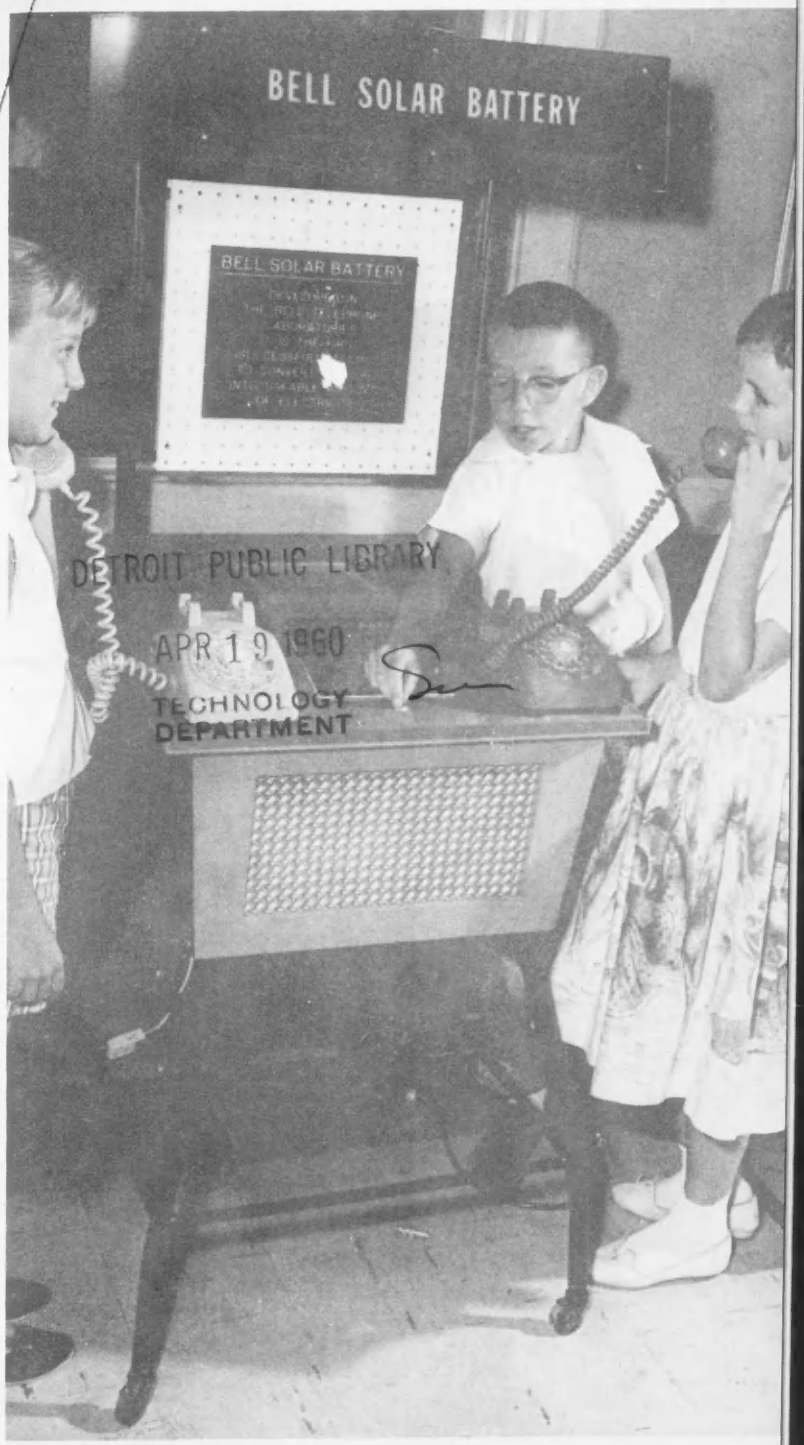
Page Four



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Would you help us, please, by sending us your estimate on how many of your subscribers have three arms. We know this contemplated phone will be ideal for them.

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GALION, OHIO

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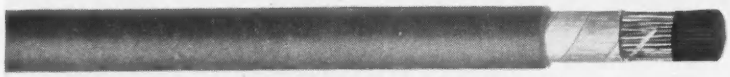
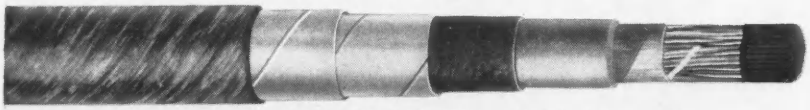


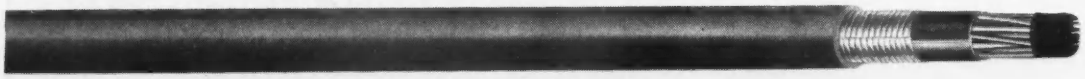
Paper Insulated Lead Sheathed Telephone Cable



Paper Insulated Lead Sheathed Telephone Cable—Armored

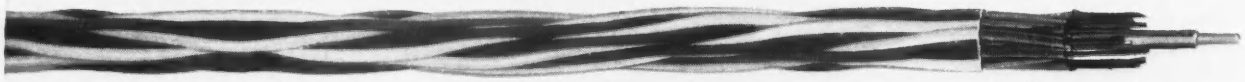
Paper Insulated Lead Sheathed Telephone Cable—Jacketed

Rubber Insulated Lead Sheathed Telephone Cable

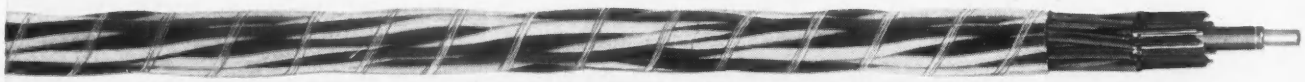


Exchange Area Telephone Cable—Aerial & Duct Type

Exchange Area Telephone Cable—Direct Burial Type



Rural Distribution Telephone Wire—.109 Inch Steel Support Wire



Rural Distribution Telephone Wire—.134 Inch Steel Support Wire for long span installations

Urban Distribution Telephone Wire—.109 Inch Steel Support Wire

Interior Telephone Cable

Drop Wire—Paralleled Figure 8

Drop Wire—Paralleled Reinforced

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VOL. 64 NO. 8 APRIL 15, 1960

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The TE&M Front Cover

"Really neat" is verdict of members of 1959 6th grade science class at George Washington School, Lodi, Calif., on their model telephone system. The science class system used a 30-line cord PBX that connected four telephones. Two of the phones were on working circuits over a real "indoor" telephone pole. — (Photo from "Pacific Telephone Magazine.")

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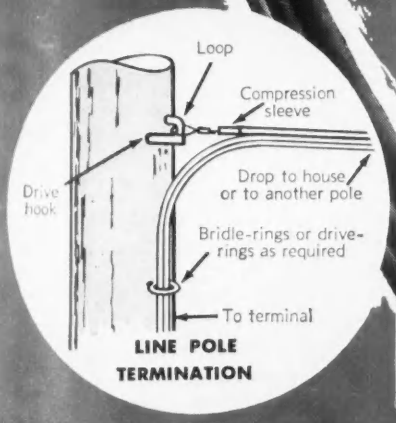

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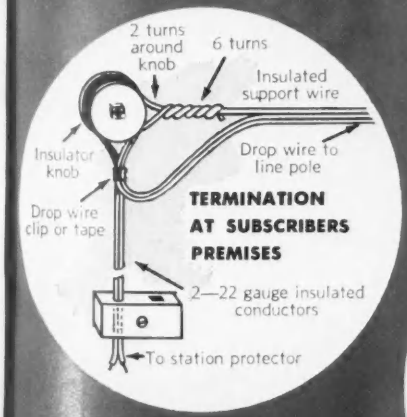

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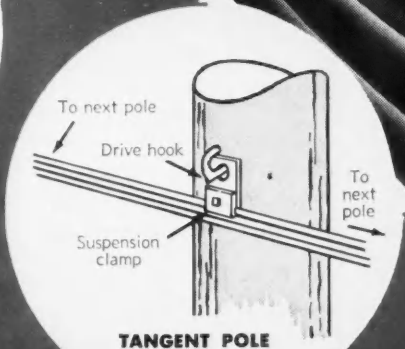

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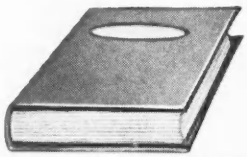

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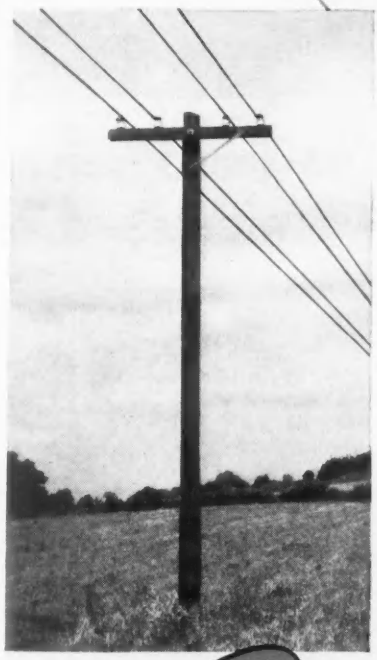

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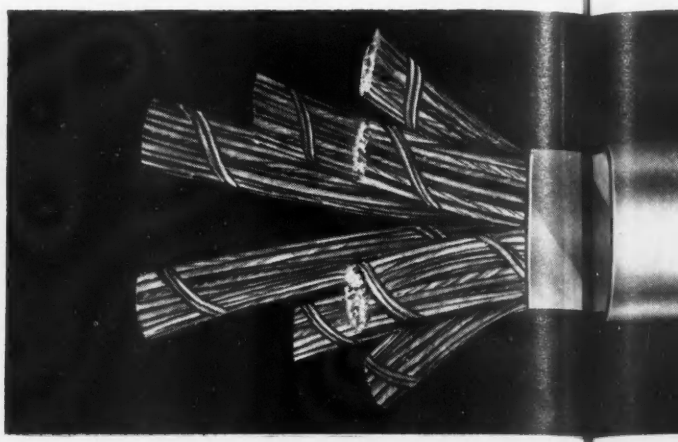

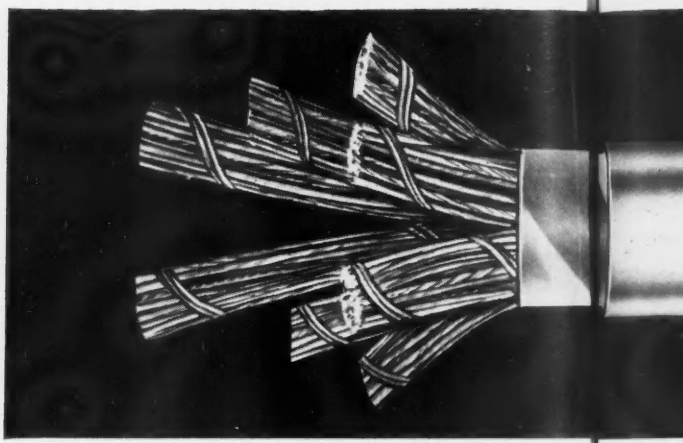

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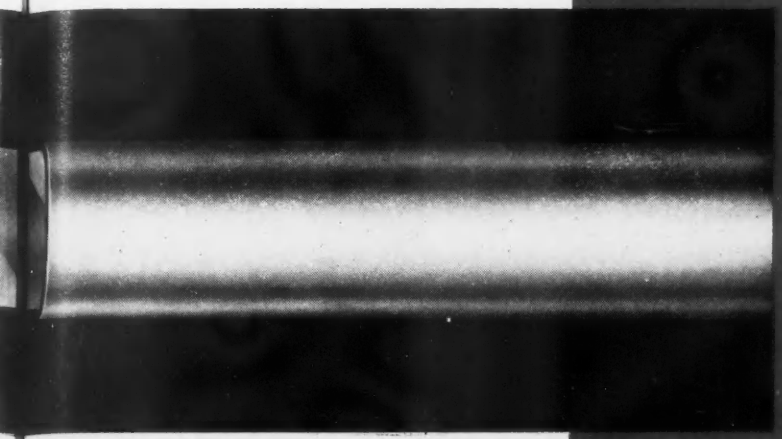

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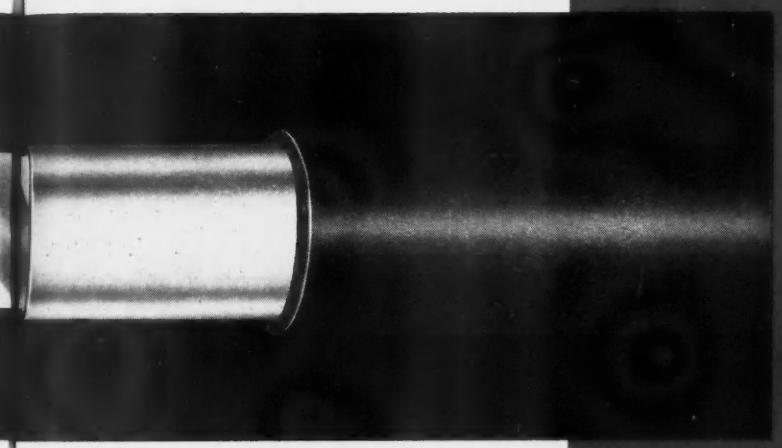

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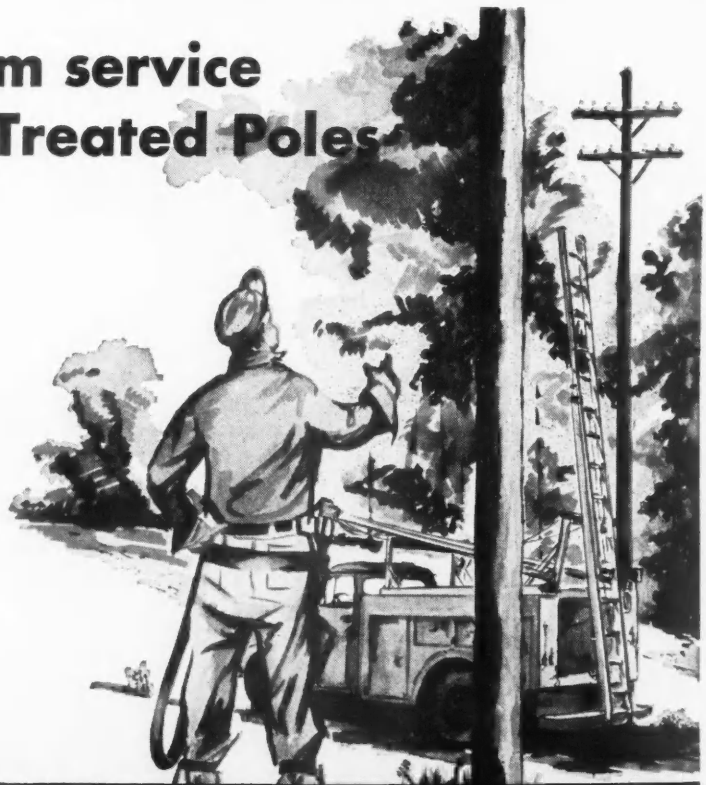

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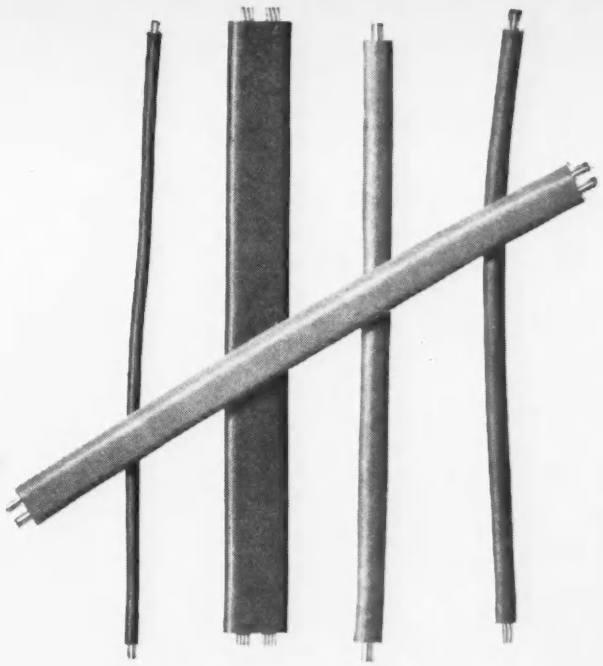

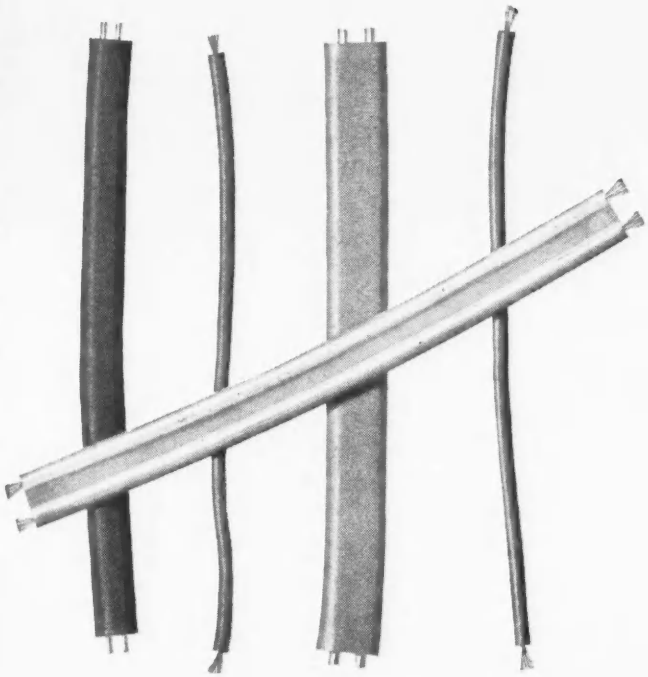

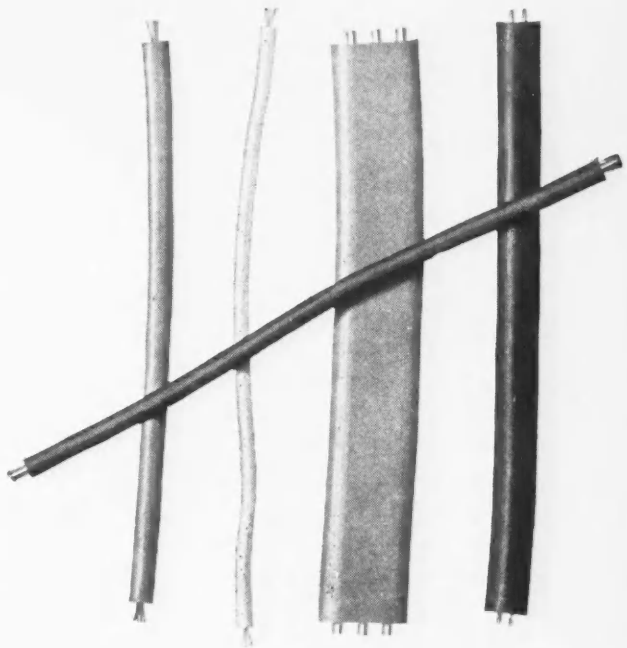

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REA Spec. PE-14.

IPCEA, Appendix J.

IMSA, Spec. 19 and 20.

Inside-outside telephone cable (Staple Gun Wire).

Jan-C-17A Type I.

MIL-C-15479A (Harbor Defense).

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Parkinson's Second Law

HAVING paid your income tax are you now basking in that glow of exaltation that should accrue to every loyal citizen who has made his annual sacrifice to the American Ideal? Then you should wait a few days before you read "The Law and the Profits," by C. Northcote Parkinson (Houghton Mifflin). It might disturb you.

Professor Parkinson is a humorist, as well as an economist-historian; but there is nothing funny about his essential thesis: "Expenditure rises to meet income . . . The effect of providing government with unlimited funds is merely to clog the wheels of administration with useless officials and superfluous paper . . . All that we buy with higher taxes is additional administrative delay."

It leaves one with the feeling that protests against any particular tax are a waste of time. If we hope to escape from the Moloch of bureaucracy, we must actively fight waste and inefficiency. We must demand more "Hoover commissions" and promote public opinion to support them and enforce the economics they recommend.

Sanitation Minus

COMMENTATOR Dorothy Diamond (Printers' Ink) notes with approval "the sterilized telephone" in a new hotel she visited. Alas, we note with disgust the anything-but-sterilized condition of telephones in many places of business. Subscribers seldom trouble about their phones until they fail badly; and most telephone companies do little to maintain them until they are reported out of order.

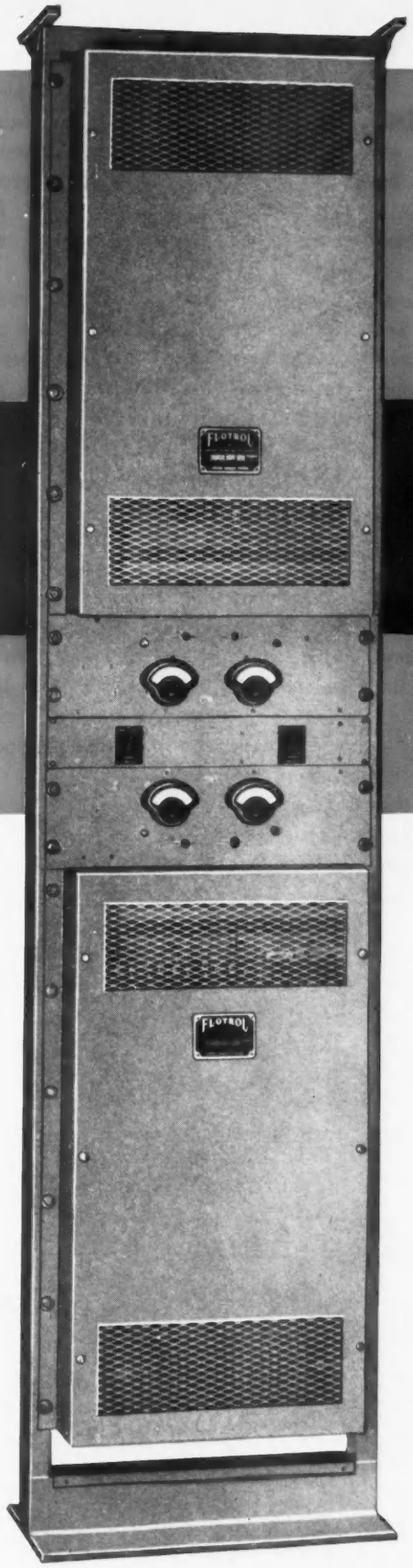
So, in most cities, too many telephones are dirty, germ-laden indecencies; and their only prospect of remedial attention is that eventually worn cords will cut out altogether and compel a visit by a trouble shooter.

Snakes Alive!

THE MARCH issue of *Southern Telephone News* (the Southern Bell Tel. Co. magazine) vividly describes a Rattlesnake Roundup in southern Alabama. The big diamondback run to ten pounds in weight and over six feet in length. The bold men who stage these annual hunts catch them by the hundreds and then turn them over to the U. S. Air Force, for use in their Survival School. Airmen are taught how to catch them for food.

Eating rattlesnakes may seem too high a price to pay for one's life, but we are assured that the meat is white, tender and similar to tuna fish. We shall take their word for it. At $1.75 for a 4-ounce can, we are not interested. We'll stick to edible bird-nests, octopus and beche-de-mer if the

MR. MUSHMOUTH, HERE'S ABOUT 50 LETTERS FROM TELEPHONE PEOPLE PROTESTING THE EXCISE TAX!
THINGS ARE TOUGH ALL OVER, MISS JONES... FILE 13!
SENATOR MUSHMOUTH
13
BONIC BOOK
FILE 13
MR. MUSHMOUTH, HERE'S ABOUT 10,000 LETTERS FROM VOTERS PROTESTING THE TELEPHONE EXCISE TAX!
O'MIGAWSH! LET'S GET BUSY MISS JONES! CALL MY WRITERS! CALL MY LAWYERS! CALL MY PRESS AGENT! CALL MY WIFE! THEY CAN'T DO THIS TO ME! LET'S REVIEW THAT TAX BILL!...ETC, ETC...!!
Jim Counts



2 *in the space of* 1

LORAIN

DUAL

FLOTROL CHARGERS

TWO STANDARD FLOTROL CHARGERS TEAMED TOGETHER FOR THE UTMOST IN FLEXIBILITY, SAFETY, COMPACTNESS

You get standby peak capacity or additional operating capacity — without using additional costly floor space!

The Lorain Dual Flotrol Battery Charger Assembly consists of two complete Flotrols mounted one above the other in a standard 23″ relay rack. The upper unit is inverted to bring all meters and controls to eye level, along with easy-access input and output leads. Total floor space: 24-3/8″ x 15″.

The two chargers can be used either individually, or continuously in parallel. In addition, an automatic control panel (optional) allows either Flotrol to be selected as the primary charger with the second unit automatically operated in response to load demands exceeding the capacity of the primary charger.

Maintenance work or replacement of either unit leaves the other in service.

Automatic proportional sharing of the load when operating in parallel is available on most of the 14 models.

Single-phase Duals offer a range of outputs from 24 to 48 amps. (input 230 or 115 volts, 60 cycles). Three-phase Duals cover 50 to 100 amps. Capacity of a Dual unit of less than maximum rating can be increased at any future time by substituting a larger Flotrol for either unit.

Lorain Dual Flotrols are offered in many combinations of chargers, controls and accessories. You can buy complete assemblies or any part you require. Get the full story.

Write for Bulletin 174A

THE ONLY COMPLETE LINE OF POWER EQUIPMENT FOR COMMUNICATIONS

our equipment is sold through leading telephone distributors

FLOTROL SUB-CYCLE

LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

"OBSERVATIONS"

(Concluded from page 14)

longing for exotic food overcomes us.

Rattlesnakes met the full force of human hate when the Grand Coulee dam was constructed in Washington. Each spring, when blasting began, hibernating rattlesnakes were unearthed. They were curled up in huge balls, dozens of them in a ball, cold, rigid and comatose. The dam workers poured gasoline on them and set them alight.

Education Blues

ARGUMENTS about American education are heating up. Vice Admiral Hyman Rickover says it is bad; our educators concentrate on frills and belittle hard mental work. Vigorous rebuttal comes from Education Secretary Arthur Flemming (of cancerous cranberries fame); our education is second to none, he says, and Rickover's attacks are bad for morale.

Perhaps part of the trouble is that our scientists won't let well enough alone. They fiddle with the facts and frustrate us. At school we learned that the atom was indivisible and what a joke that was! They said that matter was indestructible and could only be changed into other forms of matter. They hadn't heard about $E = M C^2$. They told us light moved only in straight lines, whereas now they admit that it curves around in space like a sex-starved pretzel. The moon, they told us, was a rugged mass of huge mountains. Now the U. S. Air Force discovers that it is flatter than a service club picnic.

With all this scientific ferment, good old-fashioned common sense becomes a useless liability. We have just read this: "What use is common sense? It tells us that you cannot force more into a container than it will hold. Then along comes a woman in slacks."

The ultimate result will be either compulsory retirement at age 35 or a complete re-education of every adult once in every twenty years of his life. Who will pay for it? Oh, that's easy. Make it deductible, or devaluate the dollar or something.

The Next Hundred Years

ONE HUNDRED years ago this month, the Pony Express was inaugurated. Some 80 men and 500 horses maintained a mail service between St. Joseph's, Missouri and Sacramento, California, across nearly two thousand miles of rough and hostile country.

In the world of 1860 it was the great communications achievement; but it was not a technological advance. Seven centuries before, Jenghis Kahn's Mongols operated a bigger horse courier service over a vaster territory. In fact, there had been little improvement in communications since Aeneas Tacticus signalled from hill to hill circa 330 B.C., until the coming of the electric telegraph in 1844. Then Samuel Morse and Alexander Bell triggered an amazing change. By the turn of the century, forty years after the Pony Express, communications had advanced far more than in the previous forty centuries.

Today the pace accelerates dizzily. Yet the miracles and others now undreamed will be the commonplaces of our service long before we note another centenary of the Pony Express.

The Other Fellow's Job

JIM COUNTS' cartoon (TE&M 3-15-60), of the lineman and the office man who each yearns for the other fellow's job, brought to mind Don Marquis' comment: "The typical American business man was born in the country, where he worked like Hell so he could live in the city, where he worked like Hell so he could live in the country."

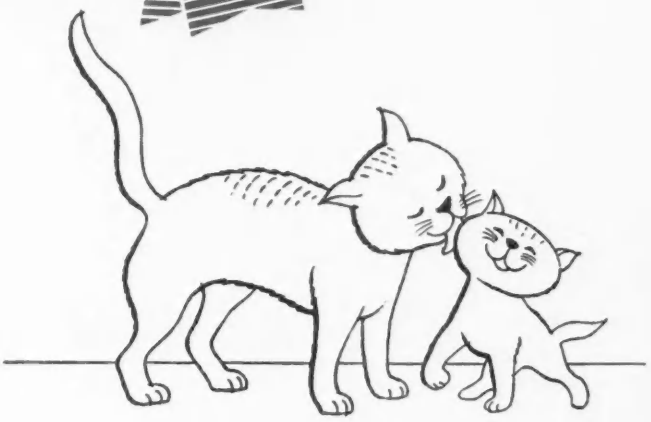
Why We Are Not Loved

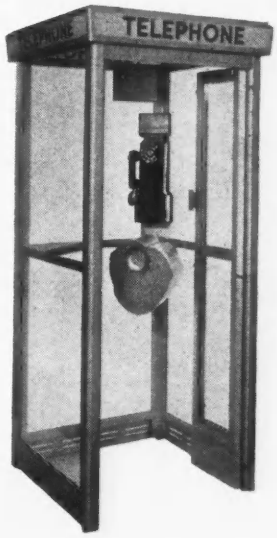
OUR REMARKS about the Russian drive to displace English as the language of international communication elicited this information: Two or three years ago, U. S. Supreme Court Justice Douglas visited Iran. He found that in the U. S. Embassy only one man, out of the staff of 55, spoke Persian. In the Russian Embassy, about the same size, all of them spoke Persian. The Russians mixed socially with the Persians. The Americans mixed with the French and British.

"CHARLIE," By JIM COUNTS

I GOT A JOB WITH THE TELEPHONE COMPANY STARTIN' TOMORROW...
WORKIN' ON TH' LINE GANG!
THAT'S GREAT, CHARLIE ... WILL YOU HAVE A CHANCE TO WORK YER WAY UP?
SURE!
DID YOU EVER HEAR OF ANYONE STARTING AT THE TOP OF A POLE AND WORKIN' HIS WAY DOWN?
4-15
Jim Counts

PROVEN BEST for ease of maintenance



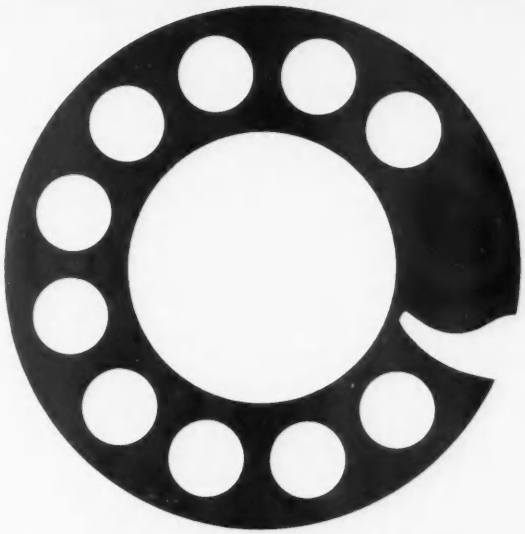


A combination of glass, enamel, anodized aluminum and simplicity of design keep maintenance problems to an absolute minimum.

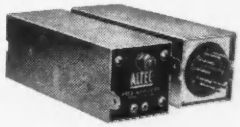
the B-N Booth

For full particulars, consult your distributor or write direct ...
Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.
a B-N booth is a busy booth!

GET ON THE ALTEC LINE—for improved telephone equipment



The best number in your book—the one that connects you with the Altec line. For performance, reliability, and servicing ease, the Altec line of amplifiers and equipment have won a resounding vote of confidence from the industry. Precision-engineered to meet your most exacting specifications, Altec products offer the improved design that makes maximum use of minimum space—and the "plus" that makes the difference—Altec quality.



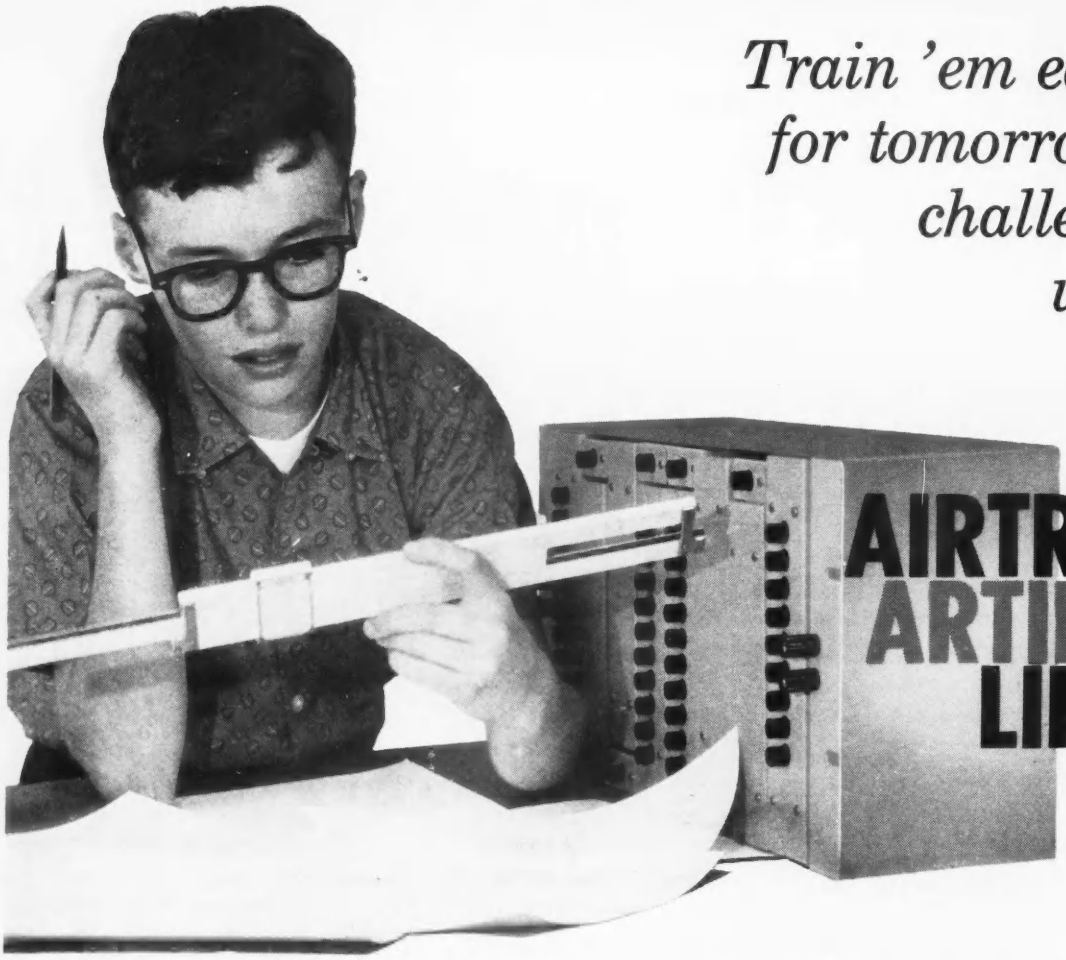
The 455A Amplifier is a transistorized repeater type amplifier wrapping up a compact package of gain for telephone circuit use. Incorporates the gain, power handling capacity, frequency response, plug-in features in the physical size of vacuum tube type repeater. Ten repeaters go in the same standard rack mount used for vacuum tube types. Operates on 48 volt DC @ 22 ma. Since it is transistorized no 130 volt supply is needed. For details, write for Altec Lansing Bulletin #13385.

The 529A Power Supply, designed for standard rack mounting, occupies only 3½" of panel space. Operates from 117 volt, 50/60 cycle AC line and delivers 20 volts DC at 3 amps., (0.3 amp at each of ten separate outlets). Maximum ripple content is below 0.002 volts at operating voltage, insuring extremely low noise and high efficiency amplifier operation. Each power outlet is individually fused with a 3/10 amp. fuse. DC voltmeter and rotary selector switch to check each distribution outlet are incorporated on front panel. Variable resistor located on panel front permits adjustment of output voltage to suit load conditions. The 529A can be used with Altec Transistorized Repeaters 477A, 449A, 450A and 453A. Write for Bulletin #13224.

For complete information about Altec telephone and paging equipment write to the address below or call PRospect 4-2900 in Anaheim or ALgonquin 5-3636 in New York.

ALTEC LANSING CORPORATION

ALTEC LANSING CORPORATION, DEPT. TM-4D
1515 S. Manchester Ave., Anaheim, Calif.
161 6th Ave., New York 13, N. Y.
A subsidiary of Ling-Altec Electronics, Inc.



Train 'em early for tomorrow's challenge with

AIRTRONICS ARTIFICIAL LINE

Look for much that's new and exciting to happen in the communications systems field in the next five years . . . DDD for most of U.S. and Canada . . . CAMA for more and more large toll usage areas . . . line concentration . . . electronic switching . . . a rapidly expanding demand for private line services . . . and a great deal more advances requiring special design.

Despite satellites, the workhorse of systems communications will still be the same old cable pairs. But with alternate routing and VNL you'll regard them in a new light; and you'll take a more searching look at load coil spacings, net loss and return loss, while bias and sigma (old words with new meanings) will force you to correct trunks that don't meet minimum standards.

You can best meet this challenge by launching a comprehensive training program to begin now!

AIRTRONICS Artificial Lines can be a vital tool in your technical training program for plant and engineering people. In them are combined all the essential elements for use in demonstration lectures, in laboratory classes — or both.

GENERAL SPECIFICATIONS

AIRTRONICS standard Artificial Lines accurately simulate a loaded or non-loaded cable pair of any desired length — from 600 to 39,600 feet.* Push-button switching affords instant control over total length or load section lengths, so that coil spacings may be set to better than 1%, or as much as 10%. Common irregularities such as bridged taps, mixed loading or coils omitted can be introduced in a moment.

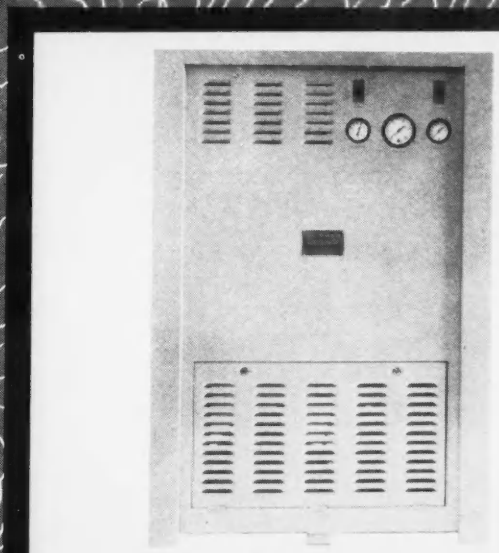
**Available with plug-in units for either #22 or #24 gauge cable, or mixed 22 and 24 gauge. Other commonly used gauges available on special order.*

For more detailed technical specifications, just ask us to rush you AIRTRONICS Artificial Line Brochure #1.021A. It will include equipment arrangements for a number of demonstration set-ups clearly showing the effect of equalizers, loading systems, reflections, singing points, and other characteristics.

another product first for

AIRTRONICS INTERNATIONAL CORPORATION

P.O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

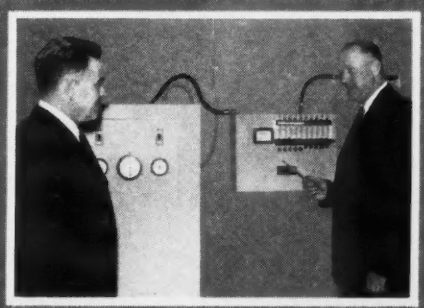


DRY CLEAN AIR

. . . at work for HIGHLAND TELEPHONE Co.

The Highland Telephone Company, of Monroe, N. Y. has recently completed several installations of PUREGAS pressurizing equipment to improve service and reduce maintenance costs on their telephone circuits, serving 11,640 stations.

Highland Telephone thus has become another in the growing number of independent telephone companies across the nation that are capitalizing on the advantages of continuous feed pressure systems to dramatically reduce moisture-caused service difficulties in their telephone cables.



President F. S. Florance and Plant Supervisor, C. A. Smith inspect their PUREGAS Air Dryer installation.

Here, in brief, are a few of the advantages of PUREGAS Cable Pressurization:

- *Lower Maintenance Costs*
- *Better Customer Service*
- *Prompt Notice of Sheath Breaks*
- *Longer Cable Life*

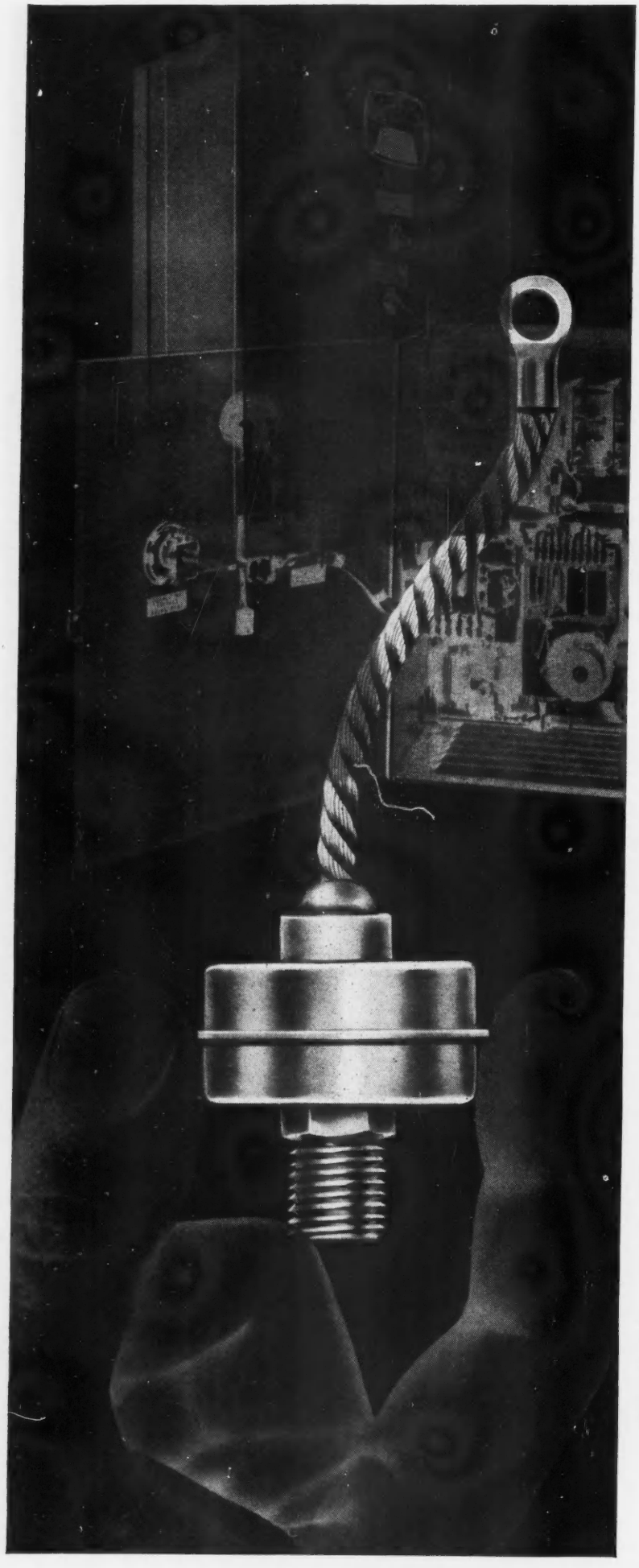
To find out how a PUREGAS Pressurizing Program can just about eliminate emergencies caused by sheath breaks and moisture damage . . . Check-off the bulletins you would like, and send this page to us with your name and address.

- ☐ Data Sheets on Model 750, 1500, and 5000 Air Dryers
- ☐ "Why Cables Should Be Pressurized"
- ☐ "Desert Dry Air . . . a boom to the Telephone Industry"
- ☐ Cost Comparison . . . Air Dryers vs Nitrogen
- ☐ "Meter Panels for Continuous Feed Pressure Systems"

PUREGAS EQUIPMENT CORP.

578 Oak Street, Copiogue, L. I., N. Y.

PEC



NEW EXIDE SILICON DIODE TELEPHONE RECTIFIER

- **Ageless Silicon Diodes**
- **Maintenance-Free Circuitry**
- **±1% Voltage Regulation**
- **Improved Filtering**

Here is the float rectifier the telephone industry has been waiting for . . . a telephone battery charger by telephone battery people . . . a proven design now operating in hundreds of utility float battery installations.

You don't have to adjust the regulating equipment constantly to suit aging rectifiers, because silicon diodes do not change characteristics with time. Your rectifier lasts longer, needs practically no attention. You have a choice of several a-c voltage taps which allow proper initial selection for closest regulation.

A magnetic amplifier charging regulator without moving parts helps assure you of consistent voltage regulation within ±1% all the way from *zero* to full load current at the float voltage setting. This includes the particularly important 0 to 15% range.

26 models cover all standby battery applications in the telephone field. Write for more information on the one that suits your application to: Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 20, Pa.

Exide®

For Underground Or Overhead Construction

Call Us Collect!

CREWS AND EQUIPMENT AVAILABLE NOW

Mullen Construction Company

2002 East Wisconsin Ave. REgent 4-9881 Appleton, Wisconsin

THEY LOVE ALCOA ALUMINUM BOOTHS IN WOOSTER OHIO

REPORTS E. V. Ault, Commercial Manager, Wooster Division, Telephone Service Company of Ohio:

"As a public service, we installed this Alcoa outdoor booth on the public square in Wooster, Ohio, in October, 1957. While our primary intention was to furnish additional convenience for our local subscribers, we are naturally pleased that the booth also contributes to our revenue requirements. This booth is so popular that its revenues average 15 per cent above the 79 other aluminum booths we have in the state."

Mr. Ault continues: "We like the Alcoa booth for other reasons, too. It's economical to maintain. It needs only routine sweeping and an occasional washing down. Our Ohio snows can't hurt it, so it never needs painting."

Telephone companies everywhere are discovering that Alcoa® Aluminum booths build revenue and customer goodwill. Learn how they can do the same for you. Write for free brochure . . . or ask your jobber to show you the Alcoa Goodwill Kit—the free promotional package that comes with every Alcoa booth. Aluminum Company of America, 1721-D Alcoa Building, Pittsburgh 19, Pennsylvania.

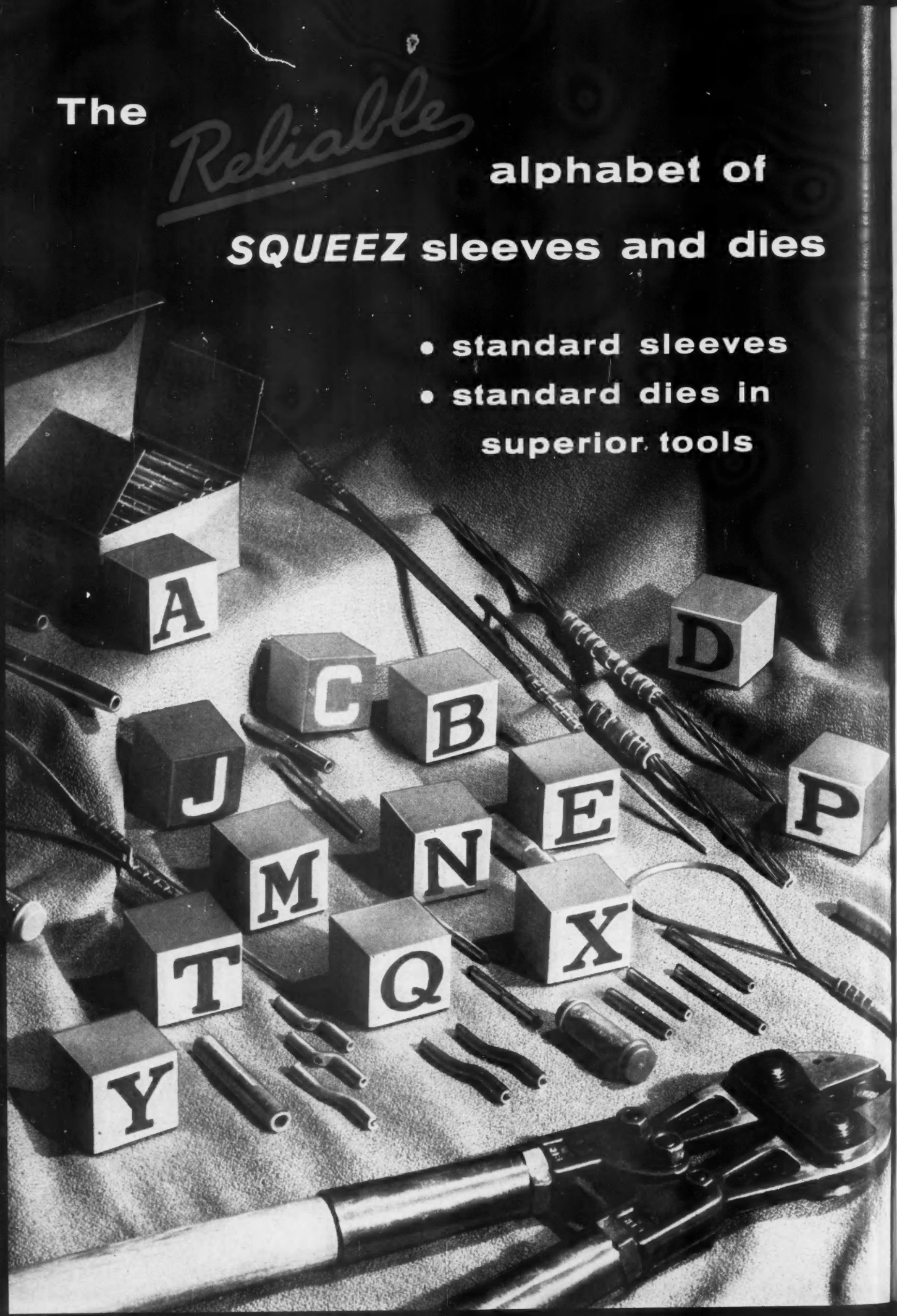
Installed at a heavy traffic location—Wooster's public square—this Alcoa Aluminum outdoor booth serves local residents and picks up additional revenue from transients.

"Never needs to be painted," says Mr. Ault, " . . . another reason our maintenance costs are negligible with Alcoa booths."

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and "Alcoa Theatre" alternate Mondays, NBC-TV


The Reliable alphabet of SQUEEZ sleeves and dies
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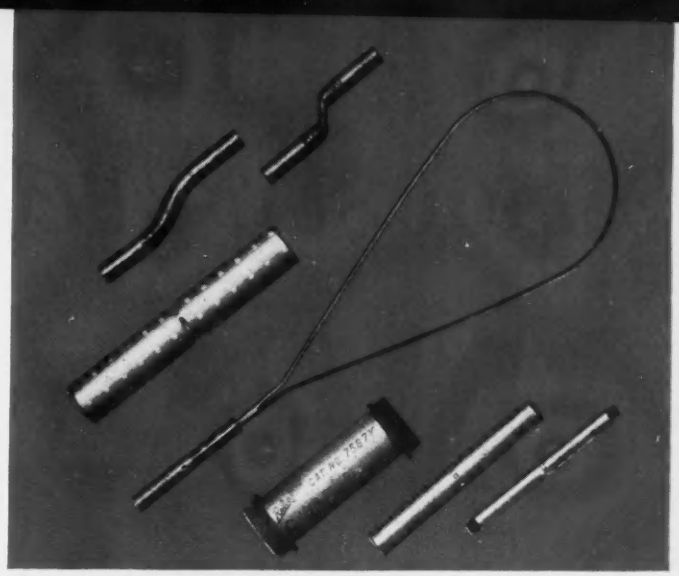
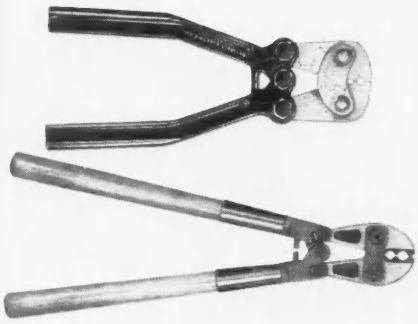


For splicing, tapping, reducing, repairing, transposing and deadending communications and powerline conductors.

over 350 catalog numbers for standard use

SQUEEZ Sleeves have been in continuous production at Reliable for over a quarter of a century, and are manufactured to close tolerances meeting rigid requirements. For easy identification, you'll find Reliable *SQUEEZ* Sleeves clearly marked for wire type, size and die groove.

SQUEEZ Sleeves are for use with aluminum, ACSR, solid and stranded copper, copper covered steel and galvanized steel.



Two of several fine quality compression tools listed by Reliable with various standard dies.

SQUEEZ Tools with standard dies

Reliable *SQUEEZ* Tools, with the dies that have become standard, produce highest die pressures by toggle action requiring minimum effort. They are factory set to standard specifications. Method of adjustment, to compensate for inevitable wear, does not invite field tinkering. If desired, minor adjustments can be made by selected personnel using instructions available from Reliable.

Ask your Reliable distributor for complete details on *SQUEEZ* Sleeves and *SQUEEZ* Tools. Their fine quality will meet most exacting requirements.

Factory service for your *SQUEEZ* Tools

Reliable offers a factory repair service for *SQUEEZ* Tools. Minimum charge is $2.00 per tool for inspection and adjustment. Parts and labor at nominal additional cost.

Reliable

ELECTRIC COMPANY • FRANKLIN PARK, ILLINOIS

A SYMBOL OF INTEGRITY SINCE 1909

Boost revenue with thebu

ebusinessman's telephone...

Kellogg K-1A1

Here's how you can reap some of the extra monthly revenue to be earned from business subscribers.

Every business or professional office can profit from the added convenience and efficiency of a K-1A1 key telephone system. This means extra revenue for you in higher rentals and increased service.

Kellogg's K-1A1 has all the features businessmen want in a push-button telephone: complete flexibility, including added line capacity, HOLD button, intercom button (press and dial your party) . . . and a choice of smart colors that brighten any office!

Kellogg's K-1A1 has all of the features *you* want – recognized and accepted by your subscribers for its design and performance – optional arrangements to fit each subscriber's needs – lower maintenance costs – the industry's standard in quality and engineering.

Ask your Kellogg representative to give you all the details and help to work out a promotion program to help you sell the business and professional subscribers in your area.

Kellogg Switchboard and Supply Company, 6650 South Cicero Avenue, Chicago 38, Ill.
Communications Division of International Telephone and Telegraph Corporation.

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CHICAGO, ILLINOIS

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ILLINOIS:
4600 So. Tripp Ave., Chicago 32, Illinois,
CLiffside 4-4300.

KANSAS:
7th & Sunshine Road, Kansas City 15, Kansas,
MAyfair 1-4418.

NEW YORK:
327 North West Street, Syracuse, N. Y.,
HArrison 2-9251.

TEXAS:
1359 Motor St., Dallas, Texas,
Riverside 7-5191.

EXPORT:
4600 So. Tripp Ave., Chicago 32, Illinois,
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the maintenance man is alr

almost out of the picture

THAT'S WHY STROWGER COSTS YOU LESS TO OPERATE!

When purchasing central office equipment, the experienced buyer looks for a product that offers minimum maintenance. That's why so many telephone men choose Strowger Automatic. Let's look at the reasons behind their decision...

simplicity of design. Strowger operates on a step-by-step principle and has the simplest possible construction. This keeps adjustments and repairs to a minimum. The position of the switching components permits visual tracing of circuit operation. This speeds training of personnel and makes trouble-shooting quick and easy.

quality construction. Each Strowger part is manufactured to the closest possible tolerance. Careful control is applied to every component to assure accuracy of adjustment and trouble-free performance. Yes, with Strowger, the maintenance man is almost out of the picture.

FIND OUT FOR YOURSELF! Visit several Strowger exchanges. You'll discover that Strowger offers unsurpassed simplicity in design. You'll also see the craftsmanship and quality construction of this famous equipment. Convince yourself. Then get in touch with us. We'll be glad to help you plan for your dial conversions. Write Automatic Electric Sales Corporation, Northlake, Illinois. Or, call Fillmore 5-7111. In Canada, Automatic Electric Sales (Canada) Ltd., Toronto 16.

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

NORTH ERICOFON proven and accepted as the finest telephone in the world

In October, 1956, North introduced the Ericofon to the Telephone Industry. Today, three years later, the Ericofon is offered as a standard telephone instrument by hundreds of telephone companies.

The Ericofon was a proven instrument even before its introduction—proven in laboratory testing over a period of SIXTEEN years of development.

It remained only for the Ericofon to prove itself to YOU—and it has done that.

- The Ericofon has proven itself to be the most beautiful, most wanted telephone instrument in the world!
- The Ericofon has proven itself to be the most convenient telephone instrument to use!
- The Ericofon has proven itself to be the biggest single factor in building revenue increasing extension installations!
- The Ericofon has proven itself to be equal to any instrument in reception and transmission!

If you are not yet offering Ericofons to your subscribers—let the Ericofon PROVE ITSELF TO YOU—NOW. The finest telephone instrument in the world is the Ericofon. Ask any user.

The Ericofon is another product of

THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

Galion, Ohio

60-T-1

HELP US KEEP THE THINGS WORTH KEEPING

Here's what peace is all about. A world where busy little girls like this can stand, happily absorbed in painting a bright picture that mother can hang in the kitchen and daddy admire when he gets home from work.

A simple thing, peace. And a precious one. But peace is not easy to *keep*, in this troubled world. Peace costs money.

Money for strength to keep the peace. Money for science and education to help make peace lasting. And money saved by individuals to keep our economy sound.

Every U.S. Savings Bond you buy helps provide money for America's Peace Power—the power that helps us keep the things worth keeping.

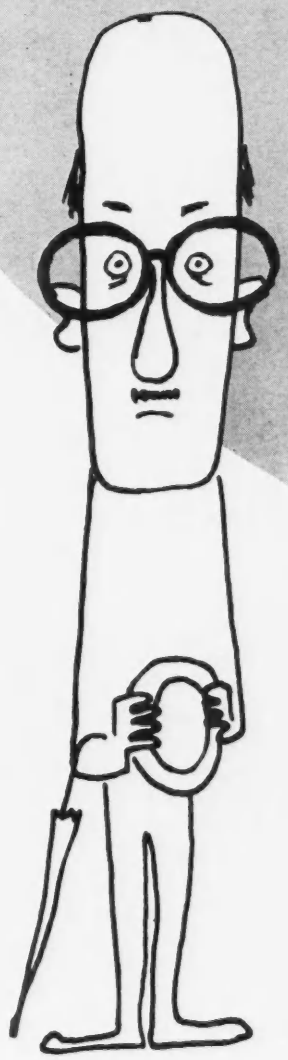
Are you buying as many as you *might*?

HELP STRENGTHEN AMERICA'S PEACE POWER

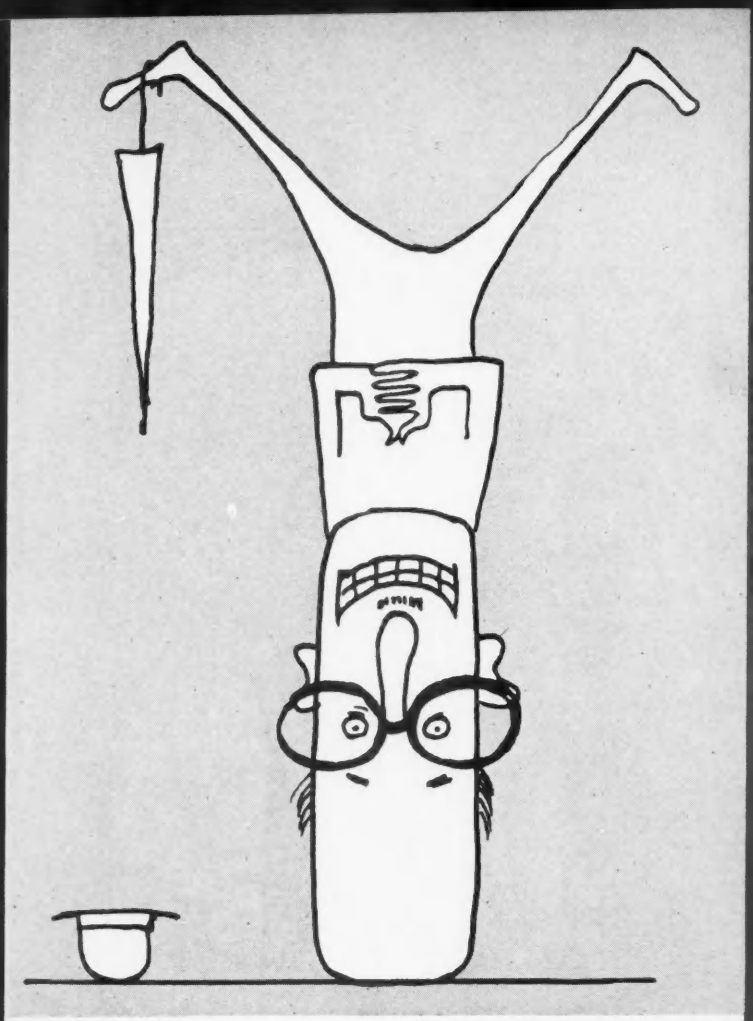
BUY U. S. SAVINGS BONDS

The U.S. Government does not pay for this advertising. The Treasury Department thanks The Advertising Council and this magazine for their patriotic donation.

Leich will do anything you say to earn your supply business



FOR MORE DETAILS, SEE THE NEXT PAGE



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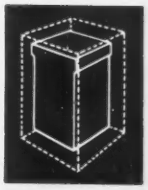
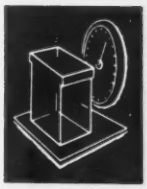


EASIER TO HANDLE. You will find it easier and quicker to move batteries in your battery room; shipping and handling costs are lower because of the reduced weight of these new batteries.



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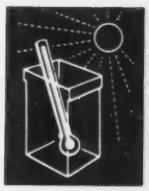

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The Stromberg-Carlson 6K-1 multi-line system will do just that, right from the start. With the handsome, compact "1575W" telephone, the system can be installed quickly and easily, by your own people, in less time than any similar system. This means money in your pocket.

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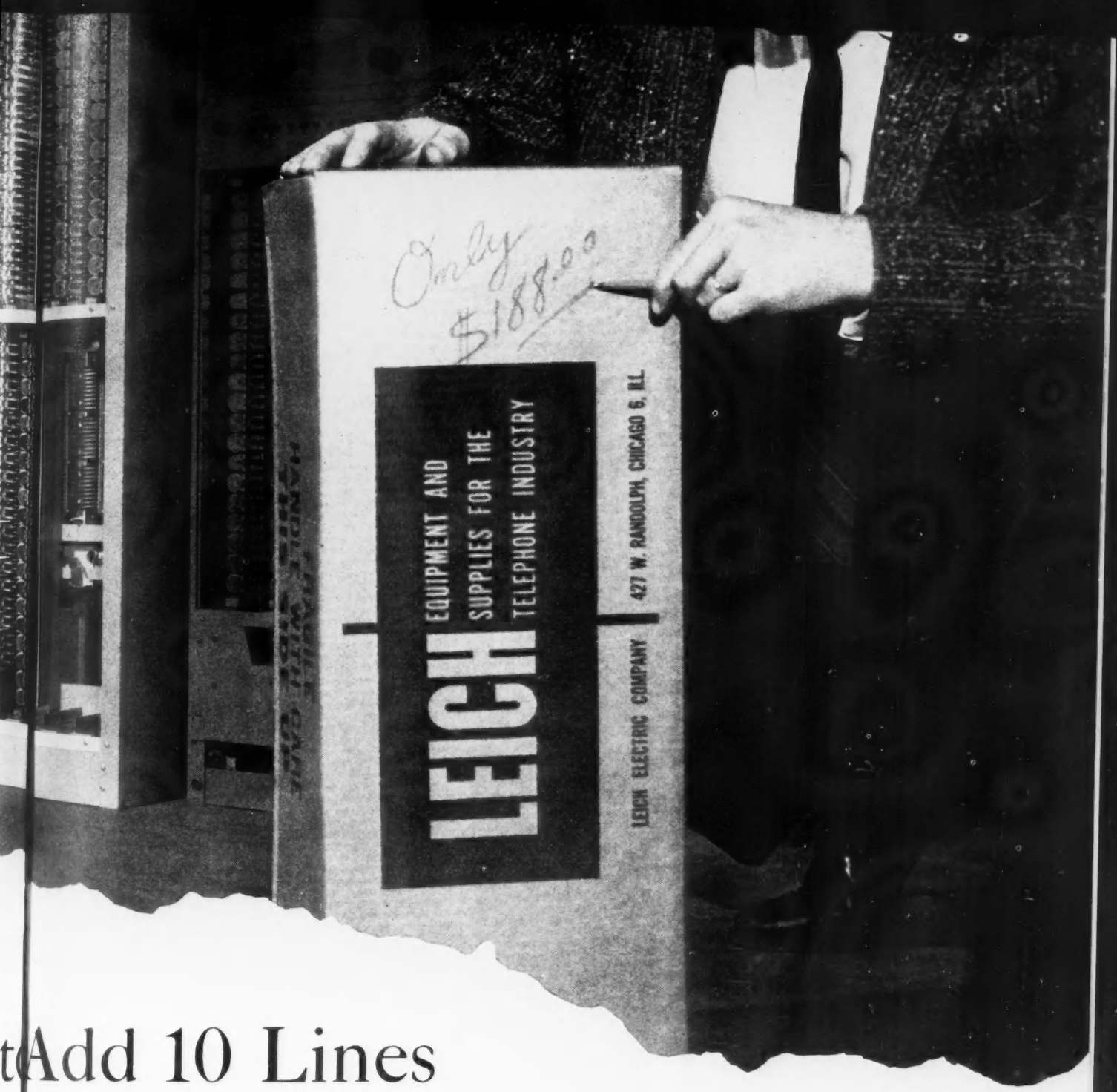

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Space-Maker has an adjustable dial and handset! The dial actually rotates 360°...tilts up to 45°. At any point it locks in place. The handset locks in seven different positions. No matter where the Space-Maker is mounted, your installer sets both dial and handset in the *most convenient* position. And that's not all...

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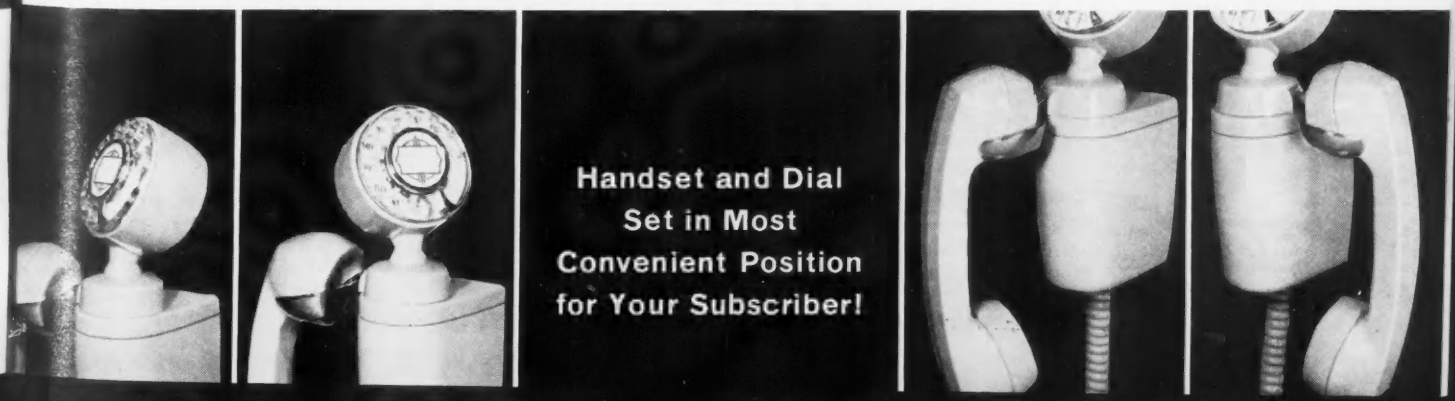
Free Promotion Kit! Includes commercials, posters, newspaper ad mat, stuffer, etc. For your free kit, write: Automatic Electric Sales Corporation, Northlake, Illinois.

*Space-Maker is a trademark of Automatic Electric Company



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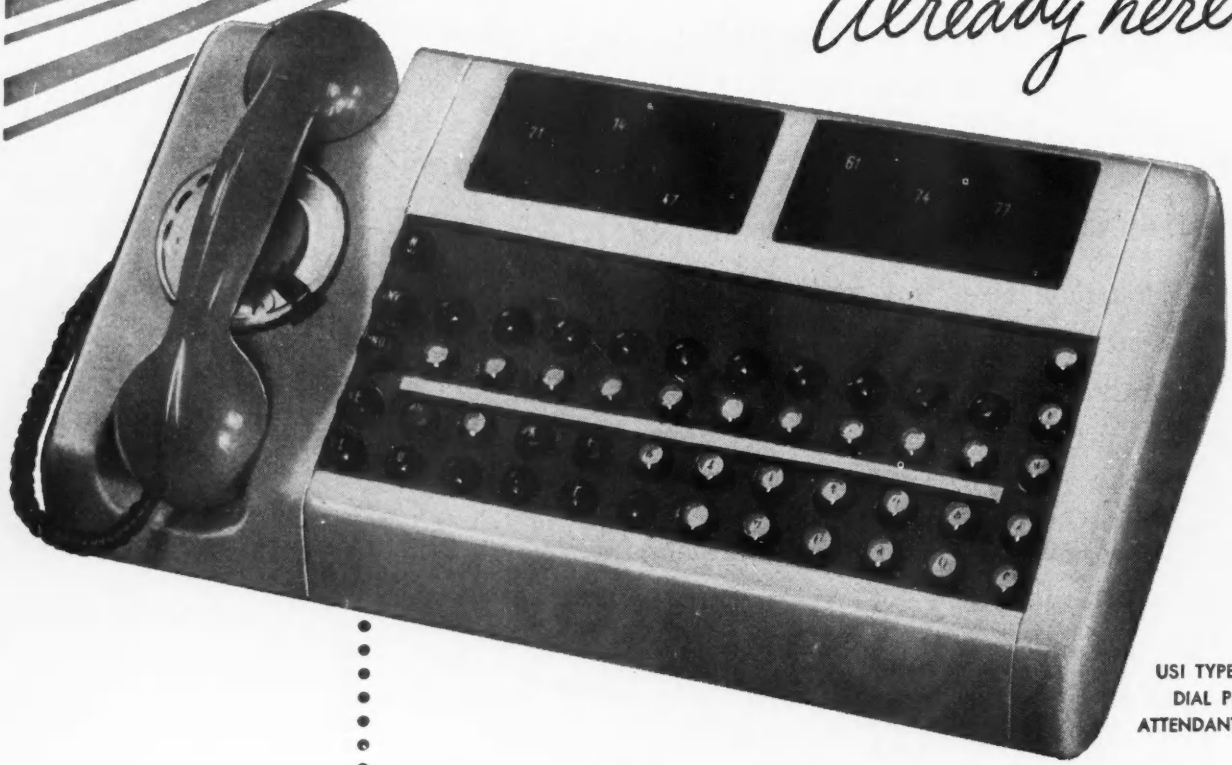

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EDITORIAL

"The New Competition"

WE WELL KNOW that members of the general public are prone to say "*the telephone industry has no competition.*" On many occasions our friends outside the telephone industry have told us telephone companies operate in exclusive territories and are free from all competition. Many of our non-industry friends have stated — "*a regulated monopoly can have everything its own way and does not need to worry about the future.*"

However, the telephone industry knows it *has* been competing in areas that vitally affect its business.

Take labor: If the telephone industry is to continue to grow and prosper it must continue to be an attractive industry to work in — young men and women must feel the industry offers an opportunity for a good living with agreeable working conditions. In this respect the telephone industry competes with all industry and it is vital that it keep well out in front if its appeal to labor continues to be successful.

Competition for management is equally pressing. It is a proved-in fact that the progress of an industry suffers when it fails to offer management equal or better opportunities than any other industry.

The telephone industry must likewise compete for new capital as it becomes needed. Right here we have a lively competition for the investor's dollar.

The consumer's dollar rates a high spot in the plans of all industry and here again there is competition — real competition that the industry is meeting with a marketing program aimed at getting its customers acquainted with what the industry has to offer.

And that is only part of the story. Today the telephone industry is faced with competition from *non-regulated* enterprises providing the same rapid voice and signal communication the telephone industry has been providing *under regulation.*

In fact, it is no secret that some of the best brains of the largest corporations in the country are at work designing and marketing radio and wire systems that will transmit voice, signals and data from point to point without using the telephone network.

Pipeline companies are putting in their own long-haul networks. Electric and gas utilities are installing their own intra-company communication systems. Interstate trucking companies talk with vehicles and wayside stations without use of the telephone network. Even the local plumber sometimes provides his own communication.

Such activity causes us to wonder how long it will be before a nationwide enterprise decides it should communicate within its own organization by bouncing voice or data transmission off a fixed satellite and thus by space communication be able to reach any point in the United States.

It also makes us realize that *a new competition is here, today,* and that telephone industry members can rightfully ask — "*Are we, like the railroads, going to react with too little, too late?*"

The records prove that 30 years ago the railroads did not pay enough attention to the competition then beginning to come from trucks and from airplanes. Today, the railroads have lost most of their high profit traffic and are left with the types of passenger and freight traffic that are difficult and costly to haul.

It seems to us the *new competition* may well be the beginning of a life and death struggle for the telephone industry, and we believe the industry must now reconsider its traditions and make them flexible enough to meet the new conditions of the 1960's.

We believe: (1) the telephone industry must review its tariffs and reprice its products, where appropriate; (2) reexamine its mental attitude; and (3) plan to provide more economic, better quality and more comprehensive service than offered by the non-regulated competition.

Of course such a program will require new products, new concepts of customer service, and new ideas. But since "The best defense is a good offense," the telephone industry must *begin today* to *meet and beat the new competition.*

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Today's new and improved construction equipment is helping the telephone industry keep costs in line despite the ever-increasing price of labor. Here is the latest information on equipment that reduces the number of men required for the work.

NEW LABOR SAVING EQUIPMENT

By JOHN S. REED

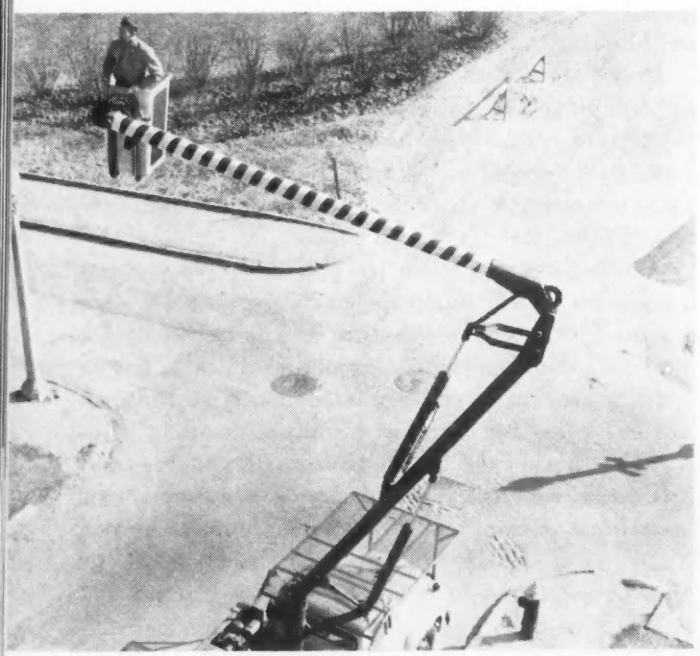
IN COMMON with other public utility groups, telephone companies have to contend with the ever-increasing price of labor in construction projects. This situation can be met in part at least by keeping down the number of men required to handle the work. The use of labor saving tools reduces the size of work forces to a minimum consistent with operating efficiency. Most of the tools are large and quite expensive. However, the initial investment plus subsequent maintenance costs is likely to be less than recurring costs of labor that would be otherwise involved over a period of time.

Much of the cost-reduction obtained by using labor saving equipment comes from the reduction in the number of men required to handle the older and more cumbersome types of equipment. A good example is the loading of a pole derrick on construction trucks. Formerly, the old-time steel derrick legs had to be dismantled by three men and the parts stored in special compartments on the truck. Self-loading derricks are now available which fold in or out mechanically, requiring the use of only one man for this operation. With pushbutton operation, even more savings of time and effort are possible because of the greater ease of control.

This article is devoted to a discussion of new and improved types of construction equipment.

Hydraulic Aerial Lifts For Greater Working Safety

ACCORDING to companies that have been using hydraulic aerial lifts, the major advantage of this type of equipment is the increased safety in work operations that it provides for the worker. The climbing of poles to work on overhead wires or cable involves the hazard from cutting out of climber gaffs while going



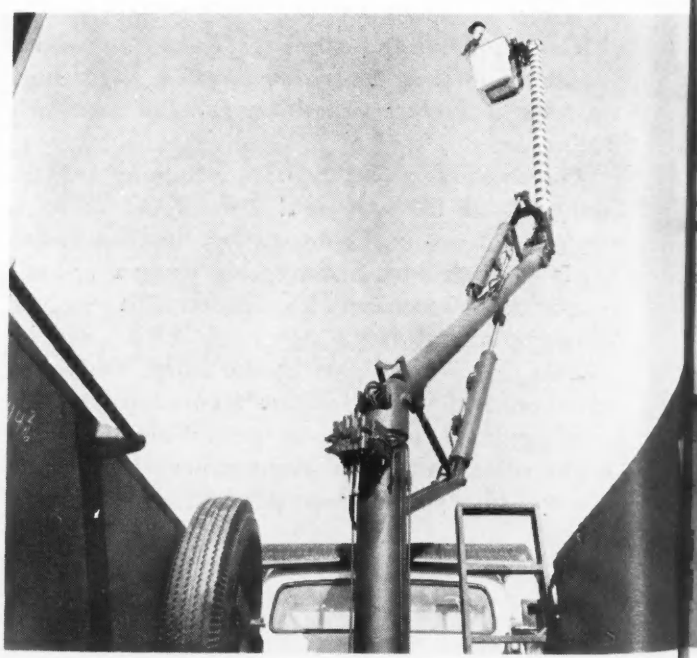


FIGURE ONE: — Left — Aerial beam in elevated position. Note controls at work basket level and engine unit in truck. Right — Aerial beam viewed from truck level. Note revolving type mast supporting the articulated beam and auxiliary controls on the mast. (McCabe-Powers Auto Body Co.)

FIGURE TWO: — Typical use of aerial beam in an emergency job where a tree had fallen across a joint telephone and power lead. Note aerial beam extended over cable to enable workman to cut limb resting on cable.

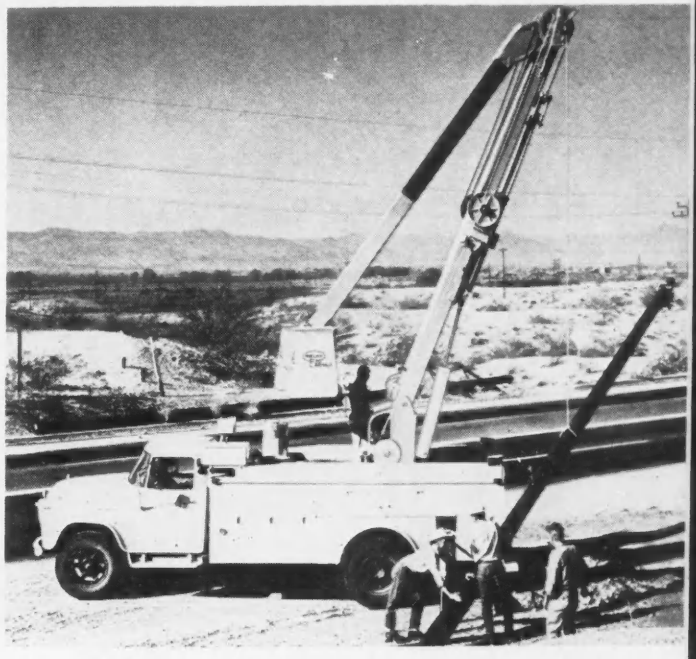


FIGURE THREE: — "Holan" Elbow aerial lift with aircraft type controls and solid insulating fiberglass section in upper arm. Note use of derrick attachment for setting poles. (Holan Corp.)

up or down or moving about on the pole. Working from a ladder, especially high ladders, is also hazardous because of the possibility of the ladder falling, or the man falling off the ladder itself. In working in situations where a ladder cannot be placed, as in the case of open-wire or rural distribution wire leads where the trouble is out in the span and repairs must be made in this location, it is necessary to lower the wires to the ground to perform the necessary repair operations.

For tree trimming operations and working on aerial lines and cable, the use of an aerial lift increases the safety of the workers. Worker fatigue is reduced through the provision of power outlets in the work basket for the operation of power tools. A gasoline-engine driven generator in this case may be mounted on the truck to provide the electric power supply to the outlets.

Two general types of aerial lifts are in use. One is an articulated type aerial beam such as the one shown in *Figures One* to *Three* and the other is a telescoping boom type illustrated in *Figure Four*. ***Next page please***

FIGURE FOUR: — Hydraulic aerial lift with telescoping boom and fibreglass arms supporting work basket. (Truck Equipment Co.)

FIGURE FIVE: — Turret derrick combines derrick, digger, and aerial lift functions. (Truck Equipment Co.)

FIGURE SIX: — Earth digger unit on oscillating hydraulic derrick in use to bore hole. (McCabe-Powers Body Co.)

FIGURE SEVEN: — Oscillating hydraulic derrick lowering pole into hole for setting.

The articulated aerial beam illustrated in *Figures One* and *Two* is basically a hydraulic operated boom which carries the worker aloft and places him on a stable work base at any necessary level. The aerial lift illustrated enables the workman to reach out-of-the-way places quickly and safely and at the same time permits him to work with ground level ease and comfort. Two steel beams independently operated and installed on a rotating mast move the work basket over and under obstructions within the range of operation. The inner beam may be moved to any point in a 115° operating arc; the outer beam may be positioned in a 270° arc while rotating mast may be turned continuously in either direction.

Each beam is moved by double-acting hydraulic cylinders through a system of linkages without use of chains or sprockets. The mast is rotated by spur and ring gear through a reducer driven by an oil motor. Power is obtained from a heavy-duty hydraulic pump which is actuated by a power take-off on the truck transmission, though other means of driving the unit independently of the truck engine may be employed.

These movements are controlled by three levers installed beside the work basket, with an additional set of controls on the rotating mast. The control levers are self-centering, returning to neutral when released and

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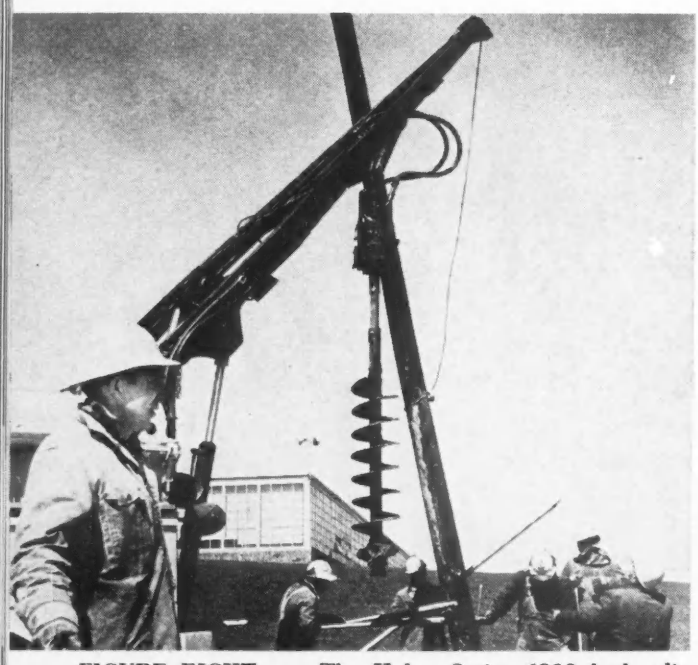


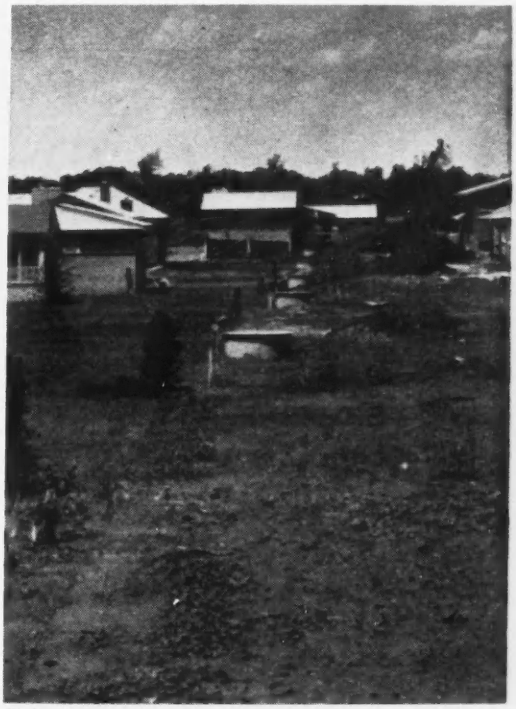
FIGURE EIGHT: — The Holan Series 6800 hydraulic derrick has an optional extensible head. (Holan Corp.)

FIGURE NINE: — York-Hoover line construction truck with hydraulic derrick and frame guided digger.

By ALLAN R. STACEY

GROWING DEMAND FOR ONE-PARTY SERVICE

One-party service demand is growing faster than the demand for general telephone service.



Telephone growth is proceeding at a more rapid pace than the growth of population.

RECENT DISCUSSIONS in our national press have centered around a world-wide population explosion. For example, the United Nations estimates that world population is growing by 5,600 every hour. A number almost as large as the population of Great Britain is being added every year to the people living on this earth.

In Mexico nearly four people are born for each one who dies. At this rate, Mexico's population will be 66,000,000 in 20 years compared with 33,000,000 now. Many other countries have similar growth rates.

The Population Explosion — U.S.A.

THE UNITED STATES Census Bureau thinks it's possible that the population of this country will grow by 100,000,000 in the next 22 years. Even more important to telephone people is that the population will increase 40,000,000 within the next 10 years. In fact, during the 1960's we shall add to our population every three years more people than live in New York City today. This raises two interesting questions: Where will all of these people live? What will be the impact upon the telephone industry?

Between half and three-quarters of these people will live in and around cities of 50,000 or more population. The remainder of the population increase will probably be spread out selectively to the rest of the country. If your telephone company is serving in or near an average large city, you will be interested to know that today the fastest growing areas are approximately 10 miles from the center of the city, but areas out as far as 30 miles will soon grow faster than they are doing today. Back in 1900 heaviest growth and the range of influence were both less than five miles out.[1]

Not only are people increasing in number but they are also moving around much more rapidly than they ever have before. In the case of our company, the average subscriber stays 40 months in one location. This means that each year almost one-third of our subscribers move away and are replaced by new families.

Although it is difficult to imagine, more than one of every five Bell System subscribers will either relocate or give up his service this year. This will amount to almost 7,000,000 moving subscribers, and over 1,000,000 will go to residences that previously did not exist. And the moving habit seems to be growing. With a larger population, what is now 7,000,000 movers will become 10,000,000 a year by 1970.[2]

How do you, as a telephone man, know if you are going to share in this growth? A general rule of thumb is that if you are growing now, you will probably continue to grow. Naturally, this applies on an average basis all across the country and certainly must be considered by you in light of local conditions.

This brings us to our first conclusion: *More and more people will want goods and services, just as a result of*

[1] *"The Changing Shape of Metropolitan America," by Amos Hawley, The Free Press, Glencoe, Ill.*

[2] *"Planning for the Sixties," by J. Robert Talbott, Bell Telephone Magazine.*

The demand for one-party service is "mushrooming" across the country, in both metropolitan and rural areas. Fertility, mobility, and ability are the underlying causes.

population increase. Included within those services is telephone service.

The Expanding Demand For Telephone Service

THE NUMBER of telephones in service per hundred population has steadily increased, despite a lull in 1958. Here is a comparison of the past six years and 1960:

Year	No. of Telephones	Telephones Per 100 of Population
1953	50,373,000	31.3
1955	56,243,000	33.7
1957	63,621,000	37.1
1959 (estimated)	70,560,000	39.7
1960 (estimated)	75,000,000	41.7

The manufacturing side of our industry is gearing for a strong increase in production of telephone sets and lines of equipment.

During 1958 there were 7,000,000 telephone sets manufactured, and it is anticipated that during 1960 8,750,000 will be made. During 1958 there were 3,200,000 lines of dial central office equipment produced and it is anticipated that 1960 production will be 3,500,000.

Total sales production of the manufacturing industry was 2.48 billion dollars in 1958 and is estimated to be 2.90 billion dollars for 1960. The significant thing is the trend which indicates that the percentage gain in sales production has exceeded the growth rate of the gross national product and population growth of our country.

This produces our second conclusion: *That growth in the telephone industry is proceeding at an even more rapid pace than growth of the population.*

Now let us see how this relates to the coming demand for one-party service, or, as I call it, "The One-Party Explosion."

The One-Party Explosion

DEMAND for one-party service is beginning to explode in many parts of the country. Study a small exchange, a medium size exchange and the largest group within the industry.

Chart No. One shows the experience of a small exchange in an area described by the owner-manager as "small town." In the year 1957 this company was making plans for a dial conversion and conducted long range engineering of outside plant. The cutover to dial service was completed in February, 1958, and by February, 1959, the company had one-party services 50 percent in excess of the number that it had engineered

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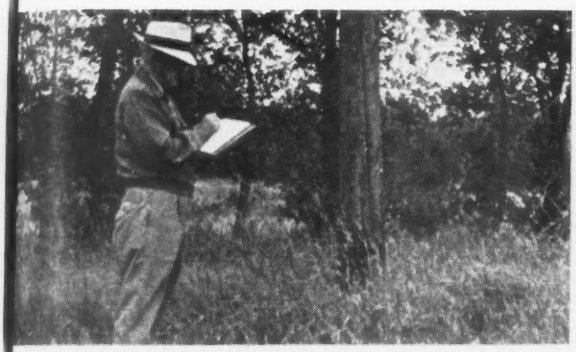
MAINTENANCE ADDS SERVICE YEARS TO THE OUTSIDE PLANT



Inspector jotting down maintenance item on his report form — in this case, a pole judged to be in poor condition and requiring replacement.

Inspector sees "floating" insulator from his car and enters another maintenance item on the report form.

A regular program of preventive maintenance will increase the service years of your outside plant.

By RICHARD ALLEN

IN THE PAST, articles have been written on the subject of preventive maintenance. So there is little question as to the importance of a continuing program of keeping up telephone plant, especially that portion that is outside and exposed to weathering effects.

It never is good economics to permit equipment to deteriorate to the point where the only remedy to prevent service failure is to replace the worn out apparatus with new and usually higher priced equipment. This is true in any business organization. Telephone companies are not exempt in this respect, and their outside plant can be made to give many years of service through a reasonable program of regular maintenance.

In urban exchanges with high population density, the outside plant consists largely of aerial and underground cables and drop wires. The terminal appearances are closely spaced and the stations are concentrated. A large working force is needed to handle the installation and removal of telephones and the clearing of troubles in the cables, drop wires, and station equipment. These men are under more or less close supervision and they have the responsibility of reporting any incipient cases of trouble that they observe in the course of their daily work.

In these large exchanges, potential cases of trouble are handled by workmen assigned to this kind of work, along with reported troubles. There is thus little opportunity for such troubles to snowball into numerous service interruptions. If the exchange cable is kept under pressure, cable troubles resulting from moisture entering through sheath cuts and breaks will be greatly reduced.

Exchanges in rural communities have a different

kind of problem. Stations are scattered over the territory instead of being concentrated as in urban areas. The outside plant consists mostly of open wire lines or rural distribution wire on poles with open-wire spurs or drops to farm stations. If there is any cable it is usually in the town plant and extensions to junctions with open wire lines.

In the rural communities, usually only one or two men are available to take care of all work requirements in a single exchange. These men have to travel long distances in their maintenance and installation trucks to reach various points in the rural exchange on their work assignments. Many places in the area may rarely be visited, because the small force cannot cover every section road carrying the wire lines during the year. The result is that deteriorated plant may remain undetected for years, or until trouble actually develops and is reported by the affected subscribers.

A common complaint that exchange managers make is that they must be limited in the number of employes they can have, so that the exchange operations may show a profit. With this limited labor force, any unusual number of station installation orders or a storm resulting in additional trouble cases will cause postponement of routine maintenance work. Deferred maintenance is bad because it results in more trouble cases developing and thus adds to the operating expenses of the exchange.

Wherever this is possible, plant workers should be assigned on a regular basis to maintenance of the open wire and rural distribution wire plant, including poles, drop wire, and cable. This work is best handled in conjunction with installation and trouble shooting assignments. The men drive the lines in their areas of assignments. They correct any defective conditions noted, such as broken or floating insulators or slack guys, on the spot. If the repair job would involve too much time or additional help is required, they make out memorandums on the conditions found so that the needed work may be done in the proper manner.

This "part-time" maintenance operation usually bypasses portions of outside plant not covered by the small exchange force, and it is necessary to set up a periodic inspection procedure which is much more thorough in detecting undesirable plant conditions. This inspection may be made on an annual basis, and if properly planned, need take only a few days in the average size rural exchange. The inspection may be made any time, though the spring season, after the trees have developed

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Outside Plant Inspection Report

EXCHANGE SAFRON. DATE 1959 INSPECTOR JOHN DOE PAGE 1

MILE AND POLE NO.	WIRE LOAD	REPLACE: POLE	CROSSARM	BRACKET	ANCHOR	GUY	INSULATOR	DROP	DROP CLAMP	PIN	TIE WIRE	HAND CONNECTION	CROSSARM BOLT LAG	JUMPER	PULL SLACK	TRIM	SPRAY	REMARKS	HANDLED BY	
510 1	4I 8C	25 6CT													X		X	Replace with 25' 6 P	CD	
2	"		8'6"									X					X		CD	
100 5	2I	20-9 CT		2B			X									X	X	Replace with 20' 9	CD	
21	"			X							X						X		LF	1-M
107 3	"				4"	2.2 M													LF	1-M
6	"							X										Replace & reroute on house	LF	1-M
26	10													X				#14 Jumper Wire 14'	LF	1-M
204 6	6		6-P													X			LF	1-M
8	6								X										LF	1-M
10										X									LF	1-M
96 4	6																	Improper clearance from power	E	
T 1480	24 20C 4I												X			X	X		LF	1-M
T 1492	24										X								LF	1-M
16 2	10I 2CW		8'6"												X				LF	1-M
16 10	"						X												LF	1-M
12	2I							X										Install outside protector	LF	1-M

IN LEFT COLUMN UNDER "HANDLED BY", DESIGNATE "CD" FOR CONSTRUCTION DEPARTMENT AND "LF" FOR LOCAL FORCES. IN RIGHT COLUMN SHOW NUMBER OF MEN REQUIRED IN LOCAL FORCE AS 1-M OR 2-M.

Typical report form used in periodic inspections of outside plant.

How To Reduce Truck Operating Costs

Proper maintenance is the secret of reducing automotive equipment costs.

Inspector checks engine's condition.

Inspection of truck chassis. (Photos from The Ohio Bell.)

Inspector checks tire condition.

By JAMES BOYD

TELEPHONE companies make considerable use of automotive equipment in transporting men and materials to and from job locations. They take a natural pride in their ability to get to trouble locations quickly in their efforts to maintain telephone service.

The motor vehicles serve the important function of transporting workmen and supervisors to and from job locations rapidly and efficiently. In addition they carry tools and materials needed for their work.

For combinationmen and installers, the trucks are virtually storerooms on wheels. The men are thus enabled to stay on each assignment until its completion, in most cases. Little time is wasted since they do not have to return to the company storeroom for materials and tools.

A construction truck is actually a good illustration of a highly efficient unit. It carries equipment designed to save time and labor in construction projects. Telephone men will remember when large crews, with as many as seven or more men, were needed to handle the heavy construction work. Today, thanks to powerful winches, self-loading derricks, and simple, efficient pole hole diggers, three-man crews can accomplish the same amount of work in less time.

With passenger cars, supervisors can go to a greater number of job locations and thus increase their supervising efficiency by spending more time with their men. This is particularly important where on-the-job training of new workmen is involved.

Factors Affecting Costs Of Operation

ONE important factor in maintaining an efficient motor vehicle fleet is the over-all cost. The equipment used need only be suitable and serviceable for

When shopping for a new car, the decision of where to buy the vehicle depends on the lowest net initial cost consistent with company requirements.

On 24-hour call, the inspector often makes emergency repairs in the field. In this picture, he is shown checking a damaged ring gear case of a digger unit.

the job to be done. The manufacture or age of a vehicle is immaterial as long as it continues to do the job at minimum cost.

At the time new cars and trucks are purchased, the first consideration is the price tag; then the performance data is studied to determine if the vehicle will fit the job requirements. Sleek body lines or the amount of chrome trim mean nothing in the selection.

Experience indicates that the average life of all company vehicles is about six years. Passenger cars travel more miles in fewer years, and thus reach replacement condition sooner than trucks. Condition, not mileage or age, is thus the deciding factor in scrapping a vehicle.

Operating costs, replacement and trade-in values differ with the ruggedness of the terrain in the area, and there is noticeable variation in operating expenses. Rugged hilly sections cause truck engines and tires to wear out much more rapidly than in areas in which the terrain is flat. Trucks purchased for hilly country are equipped with special transmissions. Sometimes tires wear out within as little as 4,000 miles; elsewhere they may last for as much as 80,000 miles.

Savings and Safety Result From Proper Vehicle Operation

ANOTHER cost savings results from training vehicle drivers in safe driving habits. Companies are beginning to find out that the safe driver is also an economical driver.

One large company that conducted a complete investigation of its high motor vehicle operating costs came to the conclusion that a reduction in gasoline consumption would bring about a big savings. At first efforts were directed towards proper mechanical adjustments. Thermostats in cooling systems were changed to make the engines run hotter, causes of gasoline leakage were corrected, manual chokes were modified to prevent their continuous use, and automatic chokes were carefully adjusted.

In spite of these special efforts, the desired results were not obtained. The company then studied the driving habits of the men who used the vehicles in their daily work. When poor driving habits of all these men were corrected, not only did the men's safety record improve, but the gasoline consumption was reduced.

In the training program the drivers were taught the following facts regarding unsafe and uneconomical driving practices: —

(1) Start and stop driving: Racing from stop light to stop light wastes gasoline. A test drive doing this over a mile course averaged 8 miles per gallon. By comparison, adjusting the vehicle speed to changes of stop lights without exceeding speed limits over the same course resulted in an average of 15.3 miles per gallon and the difference in time was only 7 seconds.

(2) Shifting gears: Shifting into high gear as soon as possible minimizes gas consumption. In tests

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OFF-THE-JOB SAFETY

While vigorous industrial accident prevention programs are steadily reducing the industrial accident rate, injuries and fatalities from off-the-job accidents are on the increase.

By MYRLE SHAFER

THERE IS a growing realization on the part of industries throughout the country that, although the industrial accident rate has been going down steadily, as the result of vigorous accident prevention programs in these organizations and vastly improved attitudes on safety on the part of supervisors and workers, injuries and fatalities from off-the-job accidents are alarmingly high.

Is it worthwhile to extend planned safety programs to include efforts to reduce off-the-job accidents? Would the time, effort, and expense involved in the attempts to reduce accidents at home and on the road and on vacations be justified?

The answer is that the effect of accidents, whether occurring on the job or away from it, is more than just the cost of insurance or compensation. In the majority of cases, loss of production time will occur, which may have a serious effect on the conduct of business, particularly when the employe is a skilled worker or a specialist whose absence would upset work schedules.

The following true incident illustrates the upsetting effect of an off-the-job accident on a very important research project in an industry.

An industrial laboratory was engaged in a high-priority research and design project with each man assigned to a specific part of the project. There was little if any overlapping of duties and it was vital for everyone to be on the job.

One man spent 10 hours each on Saturday and Sunday on his share of the project. On arriving home Sunday evening, he decided to make some repairs on his rotary type power mower. On completing the repairs, he placed the mower on the smooth surface of his driveway and attempted to start the machine.

Although the motor did not start, the blade spun under the pull of the starter cord. At the same time, because he had failed to block the mower in position, it

Mr. and Mrs. Plant Man demonstrate the proper technique of taking an object off a high cabinet in the home kitchen — using a step stool instead of a chair and having adequate help in handling an awkward item.

Here Mrs. Plant Man is pointing out the danger of leaving toys on the stairs.

Mr. Plant Man explains why it is dangerous for a young child to turn the handles on a gas range.

rolled over his foot, and the revolving blade severed the tendons in his ankle.

The man underwent prolonged surgery and lost seven days from his job at a time when his services were badly needed.

A telephone company that operates with the minimum number of employes needed to carry on the various duties could be similarly affected by the prolonged absence of a valuable employe injured while off duty.

In addition, home and road accidents to members of the employe's family may affect the worker efficiency and possibly necessitate absences from work to handle personal problems which arise from injuries to the member of the family affected.

Aside from the financial advantage to the company in cutting down the number of off-the-job accidents, good worker and employer relations will result from the interest of the company in its employes and families. It is certain that the employe appreciates the interest that his employer takes of the well being of his family as well as of himself.

A recent report by the National Safety Council indicates that off-the-job injuries among the working population amount to about ½ million per year and result in 55 million days of time lost. Deaths from off-the-job accidents total 32,000. The cost of off-the-job injuries and fatalities to the workers in this country runs to billions of dollars, a tremendous expense that is shared by employes and their families and the industries involved. *Tables One* and *Two* list off-the-job accidents that occurred to employes of a telephone company over a three-month period.

According to recent studies, the ratio between off-the-job injuries and on-the-job disabilities is extremely high. In one industrial group with an exceptionally good safety record, the workers suffered 40 times as many lost time accidents at home and on the road as they had on the job.

It is important to understand why accidents are so costly. The problem is that the costs of accidents are hidden to a large extent. The most apparent costs are:

(1) Loss of production time.

(2) Doctor and medical bills.

(3) Painful and disabling effects of the injury to the employe.

The hidden costs, like the submerged portion of an iceberg, are more numerous, more serious, and more costly. They are the following:

(1) The necessity for additional medical treatments after the return of the employe to work.

(2) Possible inability to take part in recreational and social activities.

(3) Costs of investigating the accident, preparing the reports and maintaining necessary records.

(4) Costs of assigning employes to bench or desk jobs during the period of disability.

(5) Effect on the morale of the employe from dis-

figurement or loss of important parts of his body with consequent reduction in his earning power.

(6) Upsetting of the family at the time of the accident and the burden of taking care of the injured person with resulting inconvenience to family members.

(7) Shock to other employes at the time of the accident with possible lowering of their morale.

It is thus very important to have all employes of the telephone company develop a good safety attitude both at work and at home and on the road.

An off-the-job accident prevention program can be promoted in a variety of ways depending on the size of the company and the amount of money that the company can put up for the program. Material may be obtained from the National Safety Council, also from large insurance companies. This material may consist of statistics ,pamphlets, safety slogans, posters and bulletins which may be distributed directly to the company employes with pay checks or mailed to their homes.

The following is a partial list of various brochures and papers that are included in the National Safety Council's "*Off the Job Safety Kit.*" The kit is available at a reasonable price to all interested companies.

"What To Do About Home Injuries"

"Dennis the Menace on Safety"

"Fit as a Fiddle"

Next page, please

TABLE ONE — Data on Off-The-Job Accidents to Men Employes

Description of Accident	Injuries Incurred
At Home (21 cases, 146 Days Lost Time)	
Upper section of extension ladder struck right arm when catch released	— Injured biceps muscle
Wrestling with friend at home	— Fractured rib
Brush fire occurred when benzene was mistaken for kerosene	— Burned face and arms
Struck arm when reaching to grasp piece of lumber being sawed	— Lacerated forearm
Fell from stepladder while refastening ceiling panel in garage	— Dislocation of small toe on left foot
Fell from ladder which slipped on tile floor while washing ceiling, struck back on washbowl	— Cracked lower right rib
Lost balance and fell from ladder while putting up decorations	— Cut, bruised, and burned arms
Descending basement stairway with rough handrail	— 4 inch splinter in left palm
Slipped and fell in icy backyard while standing	— Right wrist broken
Ran down basement stairway	— Muscular spasm in calf of left leg
Fell from ladder while hanging storm windows	— Broken right leg near hip socket
Knocked down by woman falling on escalator	— Left knee and ankle bruised
Empty 250 gal. oil tank being carried, slipped and struck chest	— Breast bone and chest muscles bruised
Twisted back when lifting box of groceries over the back of the front seat	— Torn muscle of fifth lumbar vertebrae
Fell and struck hand on stairs	— Second finger of left hand dislocated
Slipped and fell against kitchen window	— Cut in scalp requiring four stitches
Hand struck furnace door when clinker tongs slipped	— Bruised left hand
Slipped and fell on icy stairs — no handrail	— Bruised side and shoulder
Engine being removed from automobile chassis slipped and struck foot	— 1st and 2nd toe of right foot broken
Slipped and fell on stairs	— Fractured rib
Turned on hot water in wash tub, hose swung and sprayed shoulder	— 2nd degree burn on right shoulder
At Public Locations (11 cases, 41 Days Lost Time)	
Remonstrated with person causing disturbance, struck with billy club	— Lacerated upper lip, 2 teeth broken
Slipped and fell over curb	— Sprained left ankle
Slipped and fell on icy walk	— Bruised shoulder, pulled hip & back muscles
Twisted ankle on uneven sidewalk	— Sprained left ankle
Bitten in attempt to pet stray dog	— Dog bite and adverse reaction from penicillin
Beaten in attempted strongarm robbery	— Cut and bruised face and body, pulled ligaments in left leg
Misjudged last step at Scout camp in dark	— Sprained right ankle
Slipped and fell on ice at curb when crossing street to board bus	— Pulled ligaments of right knee
Slipped on icy stairs delivering mail	— Bruised back and right leg
Slipped on ice while getting off train	— Wrenched back
Feeding squirrels in park, bitten by squirrel	— Lacerations and puncture wounds on hand and finger. Adverse reaction to inoculation
In Automobile Traffic (9 Cases, 67 Days Lost Time)	
Passenger in car that stopped suddenly to avoid dog. Thrown against dash	— Bruised face and mouth, fractured cheek bone
Attempted to stop slamming door	— Split right thumb nail
Drove into parked trailer to avoid head-on collision	— Two fractured ribs, bruised lips
Thrown against steering wheel when truck struck vehicle	— Bruised ribs and stomach
Struck parked car in passing swerving car	— Bruised both kneecaps on dash
Intersection automobile accident	— Bruised right shoulder, bump on right side of head
Passenger in car that struck a parked car, thrown against windshield	— Cut and lacerations of head and face
Thrown against dash in auto accident	— 5 stitches to close cut on mouth, bruised knee, and shock
Rear end collision while driving	— Left shoulder and neck strained
In Recreational Activities (1 Case, 1 Day Lost Time)	
Fell while roller skating	— Twisted and strained right knee and ankle

"Falls Aren't Funny"
"Fun on a Bike"
"Have Fun"
"Home Tumbles Are No Circus"
"Is Your Home Fall Proof?"
"Let's Go On A Safe Vacation"
"Safe At Home"
"Smart Headwork for Lifesaving Footwork"
"Child Safety in the Dangerous Years"
"Catalog of Public Safety Materials"
"Specific Safety Materials for Your Program" List of National Safety Council Publications for the Off-The-Job Safety Program.

Many companies make use of records on off-the-job accidents and issue periodic reports to their employes.

Traffic Safety

THE MOST effective deterrent to traffic accidents is the application of "defensive driving" principles. The philosophy behind defensive driving is the teaching of the driving employe to handle his vehicle in such a manner as to avoid accidents either through his own neglect or the neglect of other drivers even under unfavorable conditions of weather and road.

However, it is not sufficient to train employes in the art of defensive driving. There are cases in which employes become involved in an automobile accident through no fault of their own; in other words, the accident was not preventable. What is needed is to train

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TABLE TWO — Data on Off-The-Job Accidents to Women Employes

Description of Accident	Injuries Incurred
At Home (3 Cases, 9 Days Lost Time)	
Slipped and fell in bathtub	— Badly sprained wrist
Slipped and fell on rear stairway with clothes basket	— Bruised hip and right knee
Fell down stairs hurrying to child	— Bruised lower part of back
Fainted and fell to floor, struck head on bathroom sill	— ⅜ inch cut on forehead
At Public Locations (3 Cases, 52 Days Lost Time)	
Stumbled alighting from bus	— Fracture of little toe on right foot
Slipped and fell on snow covered icy street	— Bruised right knee
Fell on slippery sidewalk	— Sprained right ankle
In Automobile Traffic (1 Case, 6 Days Lost Time)	
Thrown against steering wheel when car was sideswiped by another car	— Bruised back

The National Safety Council's "Off-the-Job" Safety Kit contains plans, ideas, and materials for promoting accident prevention at home and on the road.

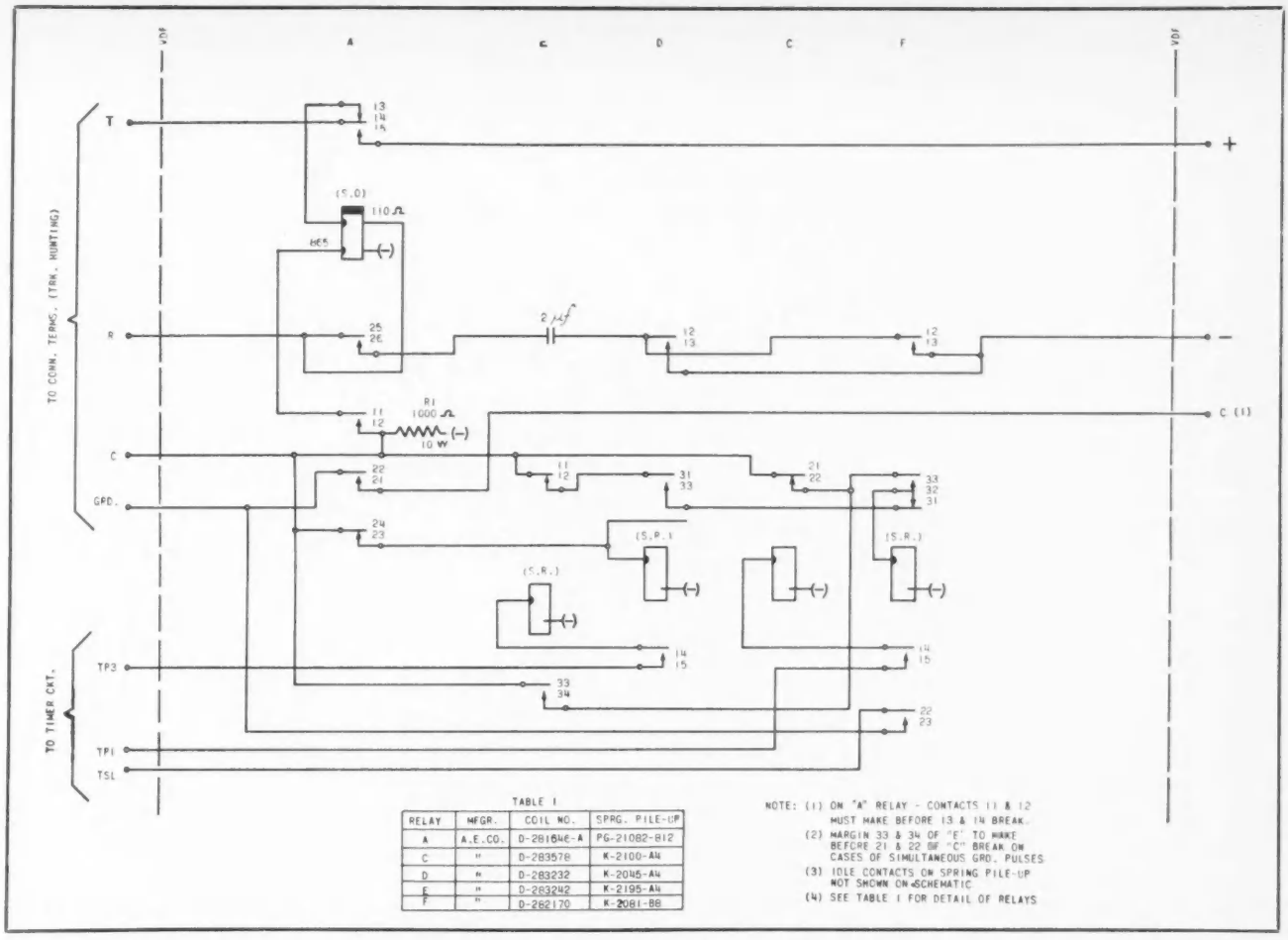

FIGURE ONE: — Schematic of equipment used in home-made public announcement system.

A "Do-It-Yourself" PUBLIC ANNOUNCEMENT SYSTEM

By C. D. EHINGER

A PUBLIC announcement system, available to each subscriber of an exchange, can be an extremely versatile unit. It can be used for the dissemination of weather reports, spot news announcements, special advertising, theater information, and, in fact, its use is practically limited only by the ingenuity of people selling equipment services.

This article will give you construction details of a circuit used by one company to build a unit which utilizes trunk-hunting connectors and terminals during the idle hours, provides spot news announcements from a customer's remote location, and provides a peg count of completed calls at the subscriber's premises as well as at the central office. It has been in service for over five years and, during that period, has handled well over a million calls with a minimum of maintenance problems.

The circuits were built up from what were essentially "junk-box" items extracted from equipment which had become idle, and the article is *not* presented with the thought that the specific parts listed, especially relays, represent the optimum. Those of you who like to work with circuits will undoubtedly find many points where improvement can be made.

Built From Surplus Parts

PRIOR to the design and construction of this unit, our company changed a number of manual-to-manual, ringdown circuits over to dial operation. With this change, the circuit plates, formerly associated with the ringdown operation, were idled and became surplus equipment.

Let's face it — extremely costly equipment, which has become surplus, can only be sold, in our busi-

ness, for a few cents on a dollar except in extremely rare instances. In this particular case, the circuit plates were left mounted on the racks (the policy of leaving idle or obsolete equipment mounted in valuable space in central office equipment rooms is certainly not one to be advocated).

In our small community, there is only one daily newspaper. It is distributed in the evening and does not publish on Sunday. This left quite a gap in local news coverage over the weekend and, in addition, did not provide a quick source of news of basketball, football, election results, etc., to the residents of the area who, like typical Hoosiers, are red-hot when it comes to sports and politics.

As is typical with nearly every company, the exchange involved had several PBX trunk-hunting connector shelves which had high traffic usage during the hours from 8:00 A.M. to 5:00 P.M., Monday through Friday, while traffic in other hours dwindled to a very low level. We also had several idle levels wherein a group of ten consecutively numbered lines were available for use.

With the above information as background, an agreement was entered into with the newspaper whereby the telephone company agreed to furnish a public announcement system with the recording equipment located in the downtown office of the newspaper. The newspaper agreed to place news announcements on the machine and to confine operations to the hours of 5:00 P.M. to 8:00 A.M. Mondays through Fridays, but all day Saturday and Sunday. Fortunately, these times coincided with the low traffic usage time in the connector shelves and, also, with the times when local news was least available to residents.

A schematic of the equipment is shown in *Figure One* and *Figure Two*.

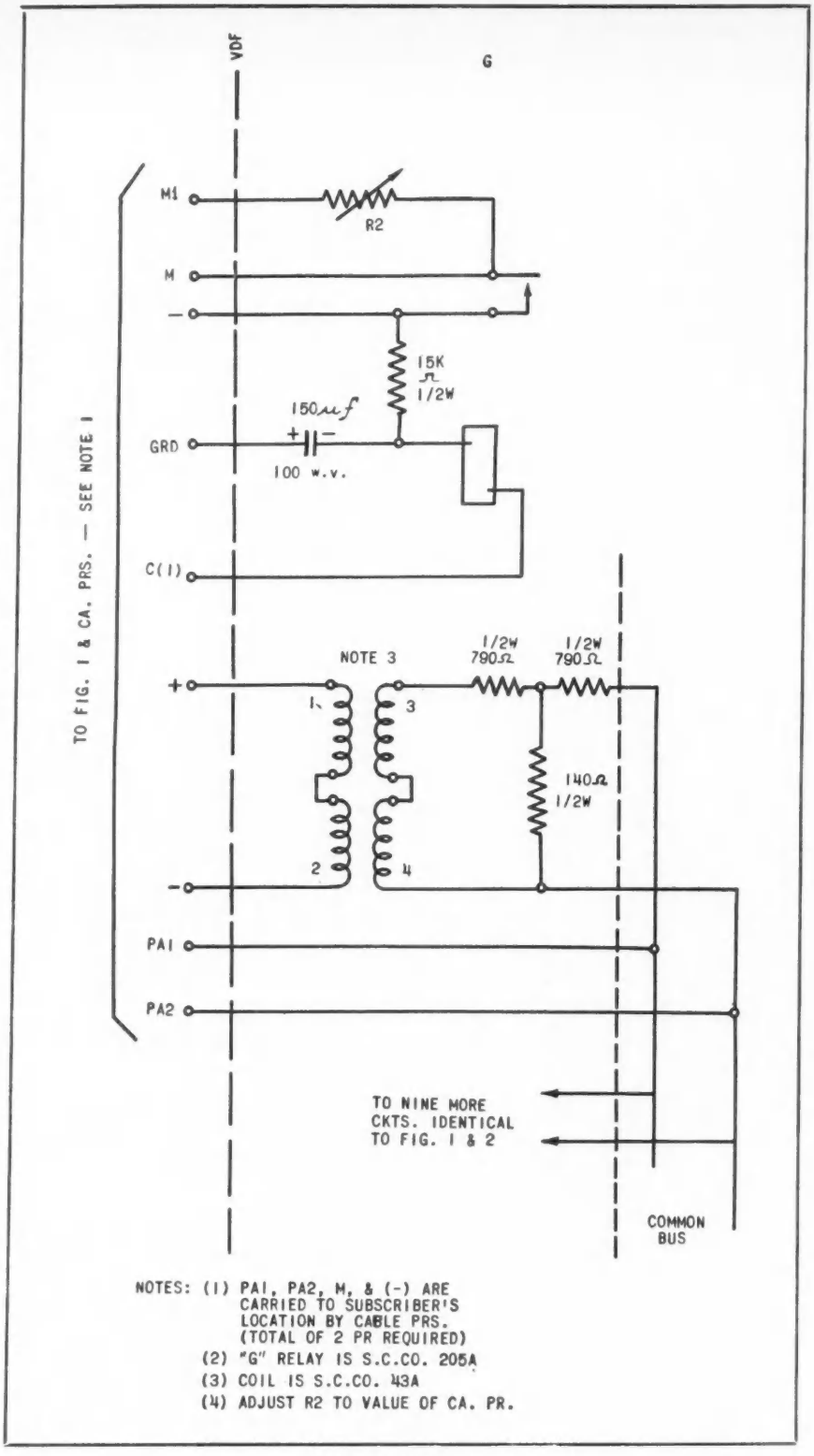

FIGURE TWO

Circuit Explanation

THE equipment was designed to be used with a step-by-step office; however, the same general principles will apply in designing equipment for use with other types of offices.

When the equipment is seized by a searching connector, battery and ground from the T and R leads is placed across the No. 1 (110Ω) winding of the A relay. X contacts 11 and 12 of the A relay operate, closing the No. 2 winding of the A relay (865Ω) to ground on the C lead. A operates fully. Contacts 14 and 15 and 25 and 26 close, switching through the T and R leads.

Ground is placed on the C (1) lead through contacts 21 and 22. At the moment of seizure, ground from the C lead through closed contacts 23 and 24 closes the circuit to the D relay (slow to release), and D operates. When A fully operated, this ground was lost, however, contacts 31 and 33 on the D relay provide a

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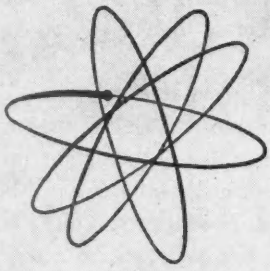


Electronic Communications

Copyright 1960, *Telephone Engineer Publishing Corp., Chicago.*

TV System Uses Phone Lines To Transmit Data

DEMONSTRATION of a television system which uses ordinary telephone lines to transmit maps, charts, and pictures over long distances was presented last month in an exchange of information between the Air Research & Development Command's Rome, N. Y., Air Development Center and Buffalo, N. Y. International Telephone & Telegraph Corp. engineers built the system in cooperation with ARDC personnel.

The system uses Air Force security equipment to "scramble" information at the sending station and decode it before it appears on the receiving screens. An audio telephone line is also used in the system.

The TV transmission is slow scan, taking anywhere from 10 to 120 seconds a frame, depending on the amount of image clarity required. Average time per frame for ordinary use is 40 seconds. In order to transmit the picture over telephone lines, the wide television signal is reduced to narrower bandwidth of telephone lines.

This reduction — on the order of 1000 to 1 — is made possible through the use of "scan-conversion storage tubes" that convert signals from an industrial television camera to the narrow band capacity of commercial telephone lines. The narrow band signal is reconverted to wide band at the receiving end. Two channels are used, one to present a set of facts or to display changing situations, and the other to "write" and store new information for transmission and presentation after the bandwidth reduction is completed.

Electronic Innards Of Missiles Featured At IRE Show

ELECTRONIC NERVES, sinews, and eyes ready to give life to tomorrow's missiles and satellites were revealed to 65,000 engineers and scientists attending the international convention of the Institute of Radio Engineers, March 21-24 at the Coliseum, New York City.

Destined for weapons and space rangers still on the drawing board, these electronic building blocks meet two "impossible" demands of the space age — to pack king-size performance into pea-size units and to reach new levels of sensitivity, precision, and reliability.

The transistor has spawned a family of so-called solid-state devices whose looks give no hint of their capabilities. Made of tiny blobs of rare metals such as silicon and germanium, they perform the functions of bulky tubes, switches, and relays with no heated filaments and no moving parts. Typical of this trend is a time-delay relay adjustable from 12 seconds to 2 minutes which has already seen service in satellites. The timer was displayed along with other wafer-thin components and button-size batteries.

Matching the solid-state devices for size are precision mechanisms that put a Swiss watch to shame. The world's smallest servo gearhead, only half an inch in diameter, is an automobile transmission scaled down from grandfather's clock to wristwatch size. Driven by a tiny servo motor, it translates electronic guidance signals into continual small "muscle movements" which keep a missile dead on its course.

This dime-size package was displayed alongside last year's model to point up recent advances in mechanical miniaturization.

Infrared detectors, which "see" distant objects in total darkness by means of the heat rays they radiate, achieve record-breaking keenness in a new scanner designed for anti-ICBM missile guidance and interplanetary navigation. Unlike previous infrared detectors, this "eye" readily picks up low-temperature objects such as orbiting satellites that are slightly warmer than the surrounding space. A gyroscope keeps the eye constantly trained on target, despite maneuvering of the carrier vehicle.

The developers of this electronic lynx say it can sense a distant ICBM and guide a defensive missile to intercept it. Used in space navigation, the eye can pick

up stars, planets, and satellites in any weather and guide space rockets to their destination.

Midget Marvels Of Electronics Displayed At IRE Show

MIRACLES of microminiaturization: A circuit that uses its own "body heat" for its operation, a 5-watt generator capable of powering an automatic weather station for two years without recharging, a transistorized circuit no larger than a half a slice of bread that takes the place of a circuital arrangement as large as the whole loaf are a few of the marvels of electronics displayed at the 1960 Radio Engineering Show of the Institute of Radio Engineers, March 21-24 at the New York Coliseum.

The electronic industry's annual display this year was as varied and wonderful as the whole field of modern development, and it cost something like 15 to 20 million dollars to put it on. More than 65,000 engineers and scientists and their friends attended the show, and more than 850 exhibits housed the marvels for the 4-day conclave.

The five-watt generator has no moving parts. Locked safely within a stable, insoluble compound at the core of the device, a pellet of Strontium 90 generating heat through its spontaneous decay operates 72 thermocouples surrounding the fuel capsule to turn the heat directly into electrical energy. It could power an automatic weather station for two years or more, and survive immersion in sea water without releasing its radioactive fuel.

Instead of trying to get rid of the heat inherent in all electronic devices, another novel device keeps the heat in by surrounding it with thermal insulation, making its inbuilt tubes in ceramic circuits completely self-heating. On display was a 100-tube digital computer built on this principle which is no larger than a package of cigarettes. Such a computer — scores of tubes, resistors and capacitors in ceramic capsules called "TIMMS" (short for thermionic integrated micro modules) — is only one of many applications to make practical the ultra-miniaturization of tomorrow's electronic equipment.

A high-speed electronic printer — a cathode-ray tube with 35,000 inbuilt separate wires in a face 3″ x ¼′ — has been produced by a New York manufacturer. Capable of printing some 20,000 characters a second, it can be used to transmit by microwave or wire, facsimiles of documents and maps — even mail-in wholesale lots — and at fantastic speeds. Each wire in the face plate is half the thickness of a small human hair. The system is expected to have many commercial and military uses.

One exhibitor at the show displayed a UHF radio receiver no larger than a fat billfold and weighing less than a pound. Another exhibited miniature gold contacts for transistors, of 99.999 per cent purity, and one-thousandth of an inch thick. Thousands of them can be contained in an ordinary sewing thimble.

A New Jersey electronics firm displayed a new micro-module weighing a couple of ounces that takes the place of a counterpart that weighs several pounds. The miniature, only as bulky as a half a slice of bread, is foreseen as one of a few modular components that someday may make up the total circuital arrangement of a television receiver, doing the job better than the parts it replaces.

Also on display was a miniature television camera weighing only a few pounds and measuring less than a foot long. It can be hidden beneath a potted plant on stage and completely controlled at a distant location behind the scenes or in the wings. If one of the circuits fails, an internal module can be snapped out and a new one snapped in, and the camera returned to service in a matter of seconds.

The Radio Engineering Show, a part of the international convention of the Institute of Radio Engineers, had 25,000 other electronic marvels on display, many in actual operation. Engineers, scientists and guests came from every city in the land, and from nearly every country on earth, to view the huge spectacle.

Romnes Urges Electronics Industry To Tackle Cost & Reliability 'Barriers'

AMID what was the most extensive array of electronic devices and equipment ever put on display, Western Electric Co. President H. I. Romnes last month urged the electronics industry not to lose sight of some of the practical "barriers" still facing it despite the flood of new inventions during the past few years, and predicted equally exciting conquests in the engineering field for the future if problems ahead are approached with the "same patience and order" that have produced the "electronic triumphs of the past."

Romnes spoke to many of the estimated 65,000 engineers and scientists attending the Institute of Radio Engineers' international convention in New York who were able to squeeze into the Waldorf Astoria Grand Ballroom for the Institute's March 23 annual banquet.

In one of the few non-technical references at the convention to such outstanding new developments such as the "maser" and "parametric amplifier," which are revolutionizing the electronics industry, Romnes posed the prospect of intercontinental communications made possible through the use of these devices in artificial satellite relay systems.

On this point, the Western Electric President emphasized that "we are not dealing in far-out speculation but with considerations now under active investigation and experimentation. The specifications for such a system remain to be written," he said, but "One proposal calls for a number of satellites in low altitude polar orbits to act as reflectors for a broadband system linking the North American and European continents. This conception, brought into reality, could transform world communications."

Romnes noted that "Currently our communications systems — our telephone and TV networks — are developed intensively within nations and sometimes with-

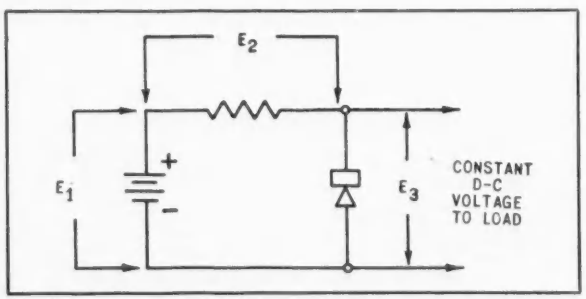
TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

By LEO G. SANDS

5.2-1 DC APPLICATIONS

A zener diode is now popularly used in voltage regulator applications. It maintains a constant voltage drop over a wide range of current. As shown in the diagram, the diode is shunted across the



load where it acts as a variable resistance, automatically maintaining E_3 constant in spite of variations of E_1. Obviously, E_2 varies in order to maintain E_3 (E_1-E_2) constant. It operates much like a gaseous voltage regulator tube.

The "Electronics Notebook" is a regular feature of "Telephone Engineer & Management." We urge all readers to read and file these informative 'Spec' book sheets for future reference.

Part Five
5-2-1

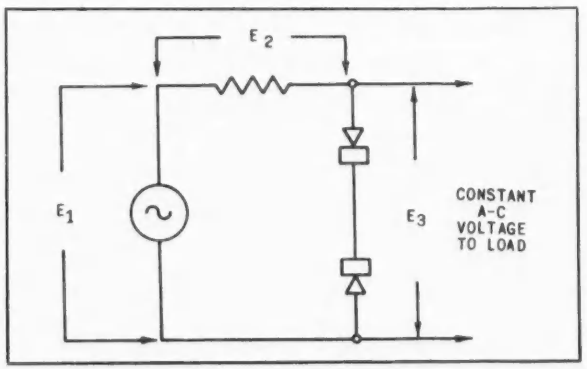
April 15, 1960
DIODES

TELEPHONE ENGINEER & MANAGEMENT's

ELECTRONICS NOTEBOOK

By LEO G. SANDS

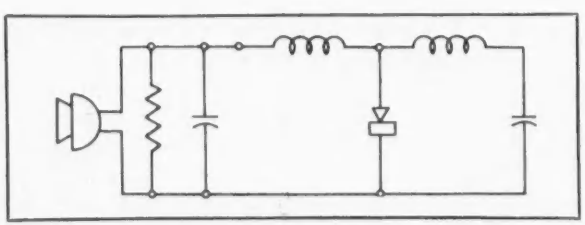
5.2-2 AC APPLICATIONS



Two zener diodes may be connected back-to-back to provide close regulation of an a-c voltage.

5.3 TUNNEL DIODE

The new developments in electronics is the tunnel diode, which can function as a receiver, transmitter or oscillator. It has less noise than a



Part Six
5-2-2

April 15, 1960
DIODES

TELEPHONE ENGINEER & MANAGEMENT'S

ELECTRONICS NOTEBOOK

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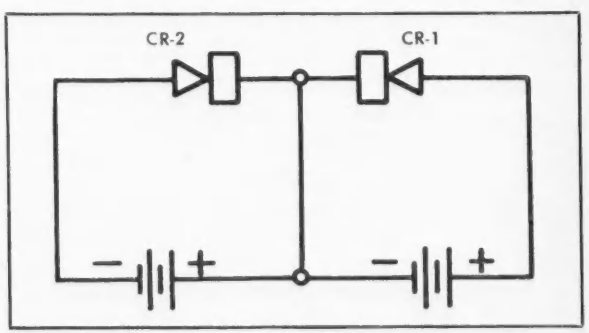
transistor or a tube and has already been made to oscillate at 4400 mc and is expected to be capable of oscillations up to 100,000 mc.

The schematic is a circuit of an FM transmitter which can be made as small as a coin. It offers very interesting possibilities in carrier modulator and demodulator applications.

6.1 TRANSISTORS

A transistor essentially consists of two diodes with a common element. As can be seen in the diagram,



CR-1 is biased to oppose current flow, whereas CR-2 is biased to increase current flow.

6.1-1 NPN TRANSISTOR

Here we have an NPN transistor with the emitter biased in the forward direction (with respect to the base) and the collector biased in the reverse direction.

Part Six
6-1

April 15, 1960
TRANSISTORS

More Data For Your "Electronics Notebook" in the Next Issue.

Electronic Communications

(Continued from page 62)

in continents, and these separate networks are joined by a limited although growing number of radio and cable links. The new channels which might be made available through satellite relays and maser-equipped receiving stations opens the way for a broad-band communications system on a global scale — one which would bring live television programs from Paris or Moscow into your living room . . . as well as telephone, telegraph and data service on a large scale."

The "frequency barrier," the Western Electric President said, is being stormed by a variety of electronic devices, in connection with long distance wave guide transmission.

"The prospect of huge bundles of communication channels totalling 40,000 megacycles in width, contained within a single two-inch pipe," he said, "has a lot of attractiveness for people in the common carrier business. Forty thousand megacycles is more than three times the width of the total presently usable radio spectrum. In view of this vast new potential for transmission, not only for telephone and TV signals and for business and technical data, but also for such things as picture-phone service, you can be sure that the many engineering problems, some of them very formidable, are under vigorous attack."

Discussing current miniaturization developments, Romnes pointed to the current "law" that "If you can see it, it is too darned big." Some of the "Thermistors" made in the Western Electric electronics shops, he said, "are shipped in little pill boxes labeled with the specific warning, 'This box is not empty'."

Romnes cited two specific "barriers" still facing the electronics industry — the "Tyranny of Large Numbers," which "dictates that, however reliable the individual components of a system may appear by themselves, the more components you have the less the likelihood of a completely reliable system," and the "cost barrier."

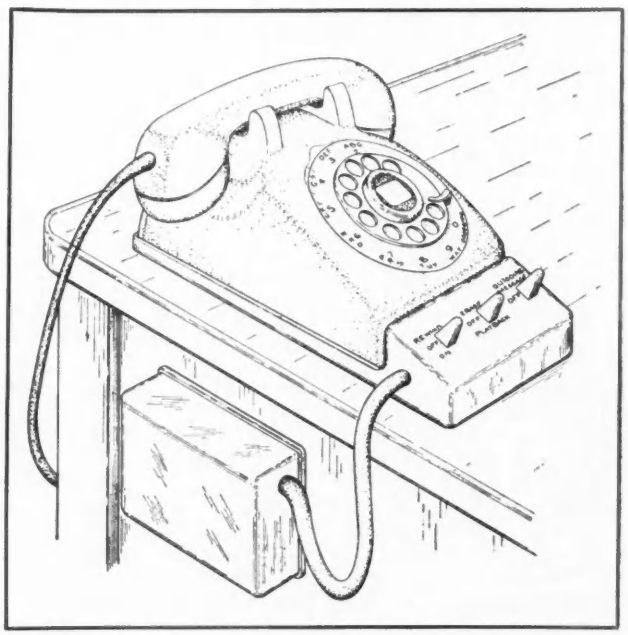
The reliability factor, he said, has been respected in the telephone industry for a long time. "A conversation over a long transmission circuit may require proper functioning of as many as a thousand amplifiers, involving more than 10,000 vacuum tubes and hundreds of thousands of other circuit elements. If we were to use commercial tubes, which are entirely adequate and economically sound for television receivers," he illustrated, "we could expect a failure in such a circuit about once an hour."

In another reference to the reliability factor with relation to the telephone business, Romnes mentioned planning on a projected electronic switchboard Western Electric may be called on to make. "In order to provide the trouble-free service we expect of this switchboard," he said, "each of its thousands of components must have a probability of failure no more than once in 220 years."

The Western Electric President described the cost barrier "as perhaps the most challenging obstacle confronting electronic technology today."

New Answering Device

AN AUTOMATIC telephone answering device which combines a conventional telephone with a miniature transistorized tape recorder is described in U. S. Patent No. 2,928,898 which, issued March 15, 1960. According to the inventors, E. R. Salzberg and D. M. Goodman, the simple operating features and the low cost of the "Teller," as the device is called, will attract the average telephone user as well as professional and business per-



sons. The answering and recording features of this device are completely integrated with the standard type 500 telephone set.

The "Teller" may be used as an automatic answering and message recording device or, by the mere flick of a switch, as an ordinary telephone. Unlike attachment type answering devices, the "Teller" provides for this dual use by integrating the handpiece, dial assembly, and ringer of the ordinary telephone with the answering components. These components are few in number; a single motor, two transistor amplifiers, an endless loop of recording tape, three stationary magnetic heads, and three switches. This arrangement of combining the telephone and recording elements, coupled with the elimination of clutches for driving the recording tapes, reduces the cost of the unit to a degree that ordinary household use is anticipated for the "Teller."

Open Line Wire & Messenger

4

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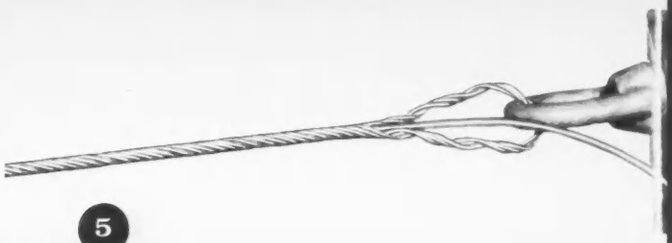
COMMUNICATIONS TIES

are the handiest, fastest way of making a "GOOD TIE." They refuse to be applied incorrectly; installed without tools; offer uniformity of all completed assemblies; positive holding. Made in Copper-Covered Steel and Galvanized Steel for specific combinations of insulators and line wire sizes.



5

Preformed TRADEMARK **DEAD-ENDS**

offer a fast, tool-free, inexpensive way to dead-end open line wire. T
nate stress points which cause fatigue failure. Available in materials
with the line wire—Galvanized Steel and Copper-Covered Steel.

7

Preformed TRADEMARK **PLASTIC SPACER UNITS (PSU)**

eliminate midspan hits and offer an economical solution for constructing longer spans with extra-high-strength wire. Made of high impact polyvinyl chloride for 5″, 6″, 8″, 10″ and 12″ spacing; other sizes to order.

8

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PLASTIC PINCH BRACKETS (PPB)

provide cradled controlled 4″ spacing before transposition. Made of high-impact polyvinyl chloride.

One-Pair Aerial Distribution Wire (C-Rural)

11

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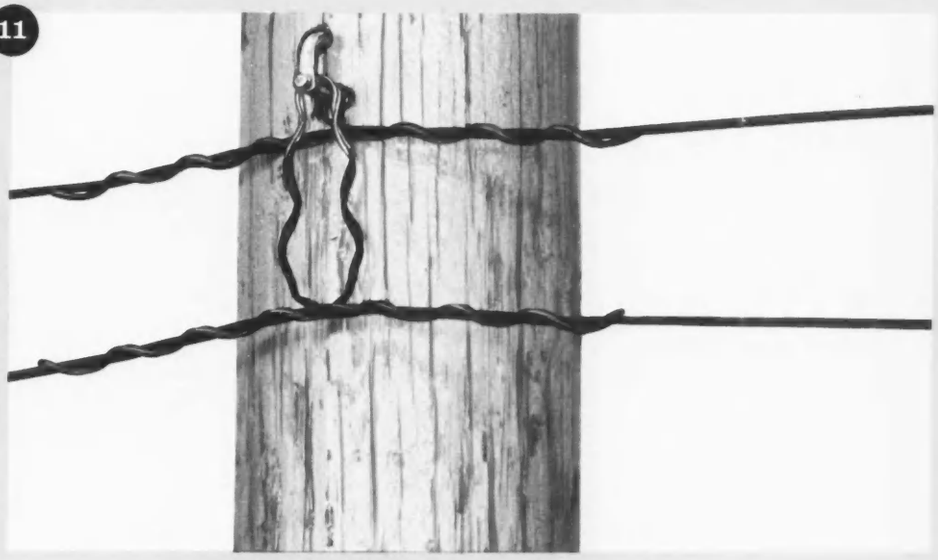
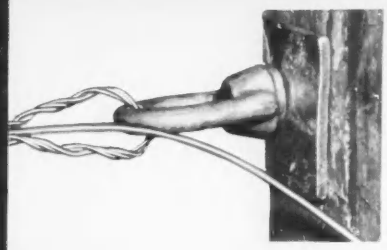
STANDARD LOOP AND ELONGATED LOOP TANGENT SUPPORTS

offer the safest, fastest suspension method for one or more one-pair Aerial Distribution Wires (C-Rural) on a common drive hook. Made of Stainless Steel, Neoprene-Coated, for 2 No. 14, 2 No. 12 Copper-Covered Steel and 2-.083 Steel wire.





dead-end open line wire. They elimi-
ure. Available in materials compatible
Copper-Covered Steel.

6 Preformed TRADEMARK **SPLICES**

repair abraded or severed line wire at tie points and mid-span, restoring full strength and conductivity. No tools needed—no wire cutting. Provide armor protection at tie points. Made in materials compatible with Galvanized Steel and Copper-Covered Steel line wire.

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TIC PINCH
CKETS (PPB)

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9 Preformed TRADEMARK

PLASTIC VIBRATION DAMPERS (PVD)

reduce fatigue damage from vibrating open line wires. Non-traveling; one size fits all open line wires.

10 Preformed TRADEMARK

SPLINT & TIE ASSEMBLIES

minimize wear and prolong the life of line wire. Made of Galvanized Steel and Copper-Covered Steel.

Preformed TRADEMARK

CROSSARM TANGENT SUPPORTS

cradle C-Rural wire to protect against contact with crossarms. For use where climbing clearance is required, or to provide ground clearance.

12

13 Preformed TRADEMARK **DEAD-ENDS**

. . . the sure, least expensive way to dead-end one-pair aerial distribution wire. Used in conjunction with Preformed C-Rural Tangent Supports, they provide a unique method of suspension. Made of Stainless Steel, Neoprene-Coated. Firm, cushioned grip distributes pressure uniformly.

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Rural Distribution Wire (B-Rural)

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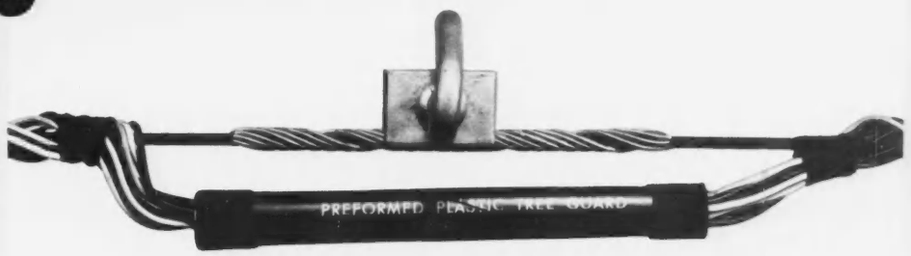
14

GRITTED ARMOR RODS (ADAPTERS)

increase the diameter of the messenger and protect it from abrasion caused by attachment of D span clamps or wire splice terminals.

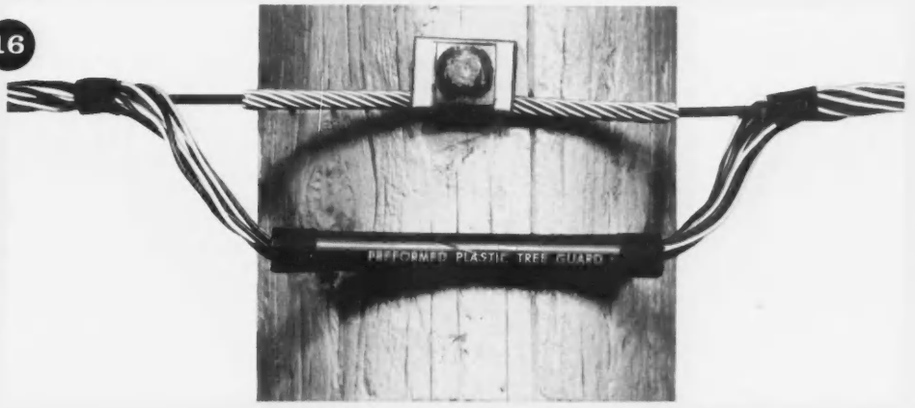


Preformed TRADEMARK

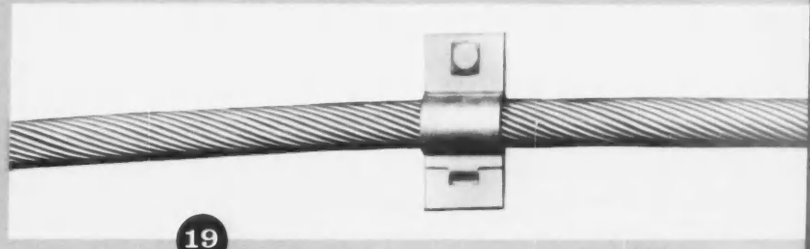
16

ALUMINUM ALLOY ARMOR RODS

with One-Bolt Clamp eliminate expensive J-Hook installations. Protect insulated messenger from clamping stresses; increase holding power. Applied over insulated line wire.



Plastic-Covered Self-Supporting Telephone Cable



19

Preformed TRADEMARK **ALUMINUM ALLOY LINE GUARDS and G**

SUPPORT CLAMPS . . . used in combination with Preforme to suspend jacketed cable.

18

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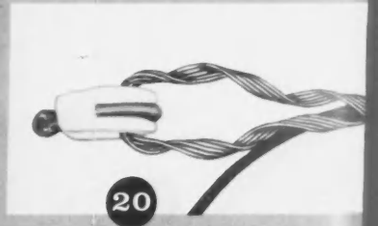
PLASTIC-GRIP DEAD-ENDS

the only way to secure covered conductor safely and permanently.

Drop Wire



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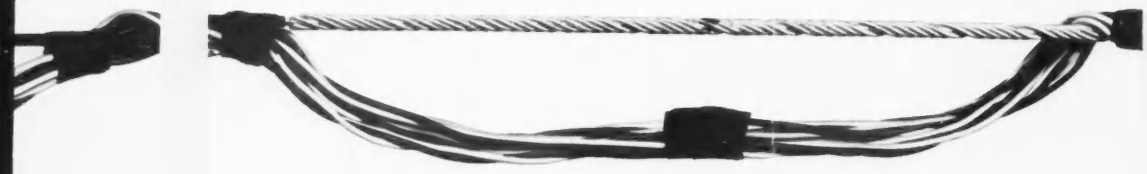
Preformed TRADEMARK **DROP WIRE DEA**

eliminate bail failures and prevent st reuse. Made of Stainless Steel, Ne

15

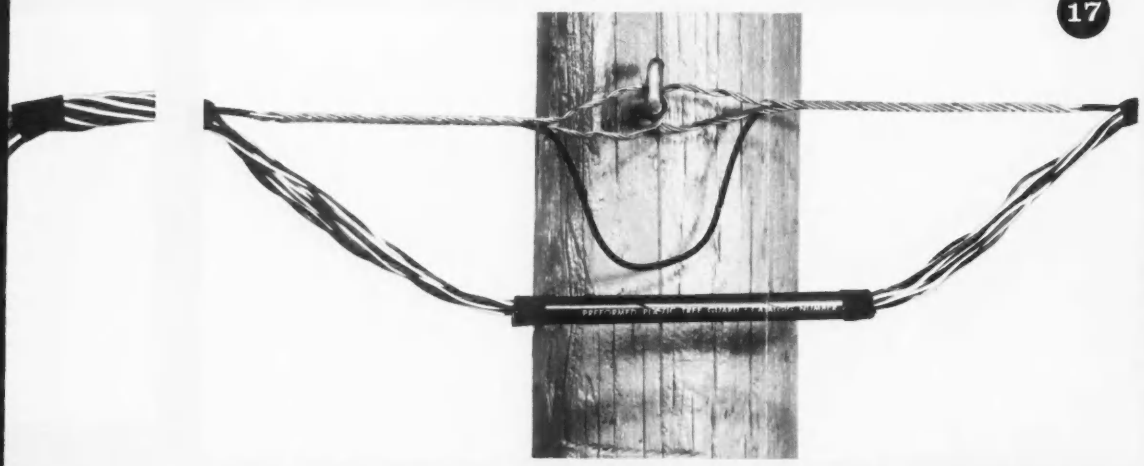


Preformed
TRADEMARK

SPLICES

. . . the fast, economical way to join stripped messenger of B-Rural wire. Applied by hand. Hold full-rated strength of the messenger.

17



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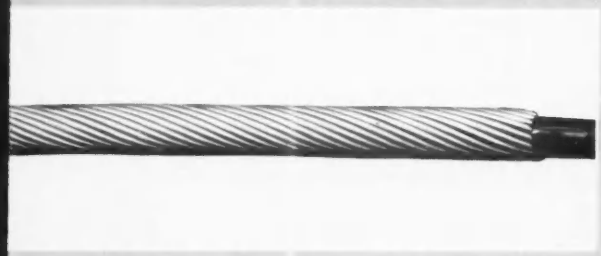
DEAD-ENDS

permit economical dead-ending of stripped messenger without cutting the messenger wire. They eliminate stress points which cause premature fatigue failure; hold full rated strength; easy hand application; can be reused.



ALLOY LINE GUARDS and GALVANIZED STEEL TANGENT

combination with Preformed PLASTIC-GRIP DEAD-ENDS

20

med DROP WIRE DEAD-ENDS

bail failures and prevent stripping of the insulation. Easily removed for
ide of Stainless Steel, Neoprene-Coated.

Check here for more information

Please send full particulars on the following checked (✓) items:

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2		6		10		14		18	
3		7		11		15		19	
4		8		12		16		20	

NAME_____

TITLE_____

COMPANY_____

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ADDRESS_____

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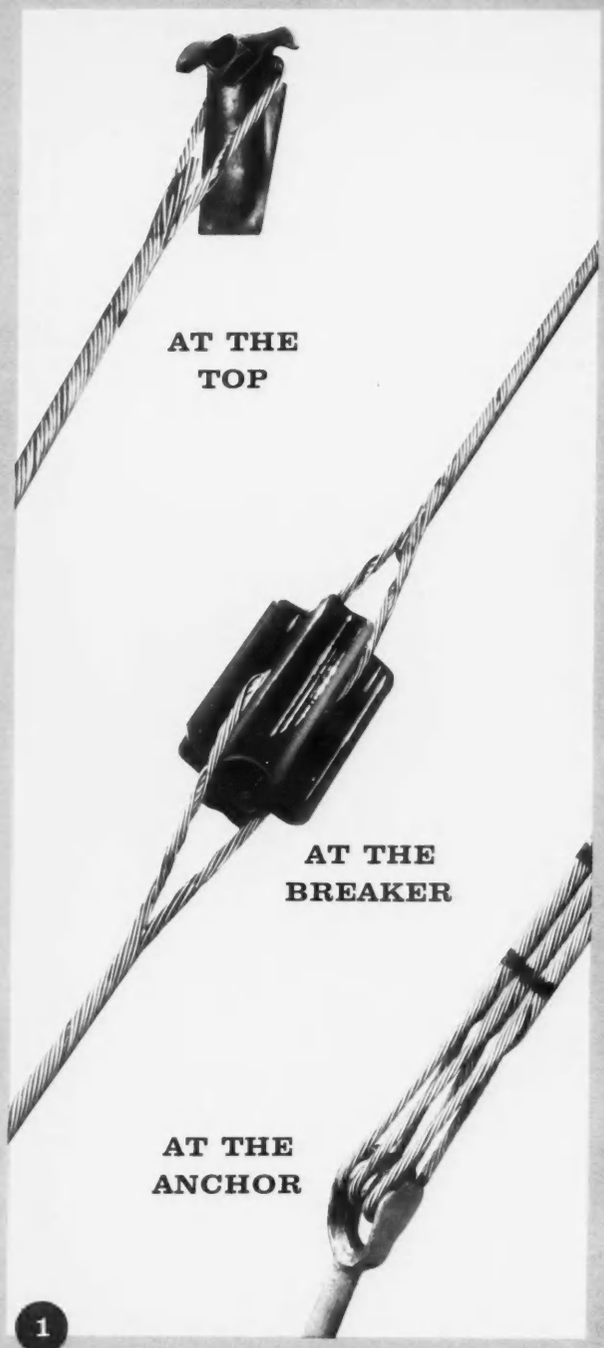
CITY_____ ZONE____ STATE_____

AND MAIL TO:

PREFORMED LINE PRODUCTS COMPANY

5345 St. Clair Ave., Cleveland 3, Ohio

Guy and Messenger Strand



1

GUY-GRIP TRADEMARK **DEAD-ENDS**

are offered for all sizes and materials of guy and messenger strands. Now available in Open Helix and Cabled Loop designs. GUY-GRIP dead-ends are fast, safe, and easy to wrap on by hand; hold 100% of the R.B.S. of the strand to which they are applied.

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tool-free
uniform
attachments
with
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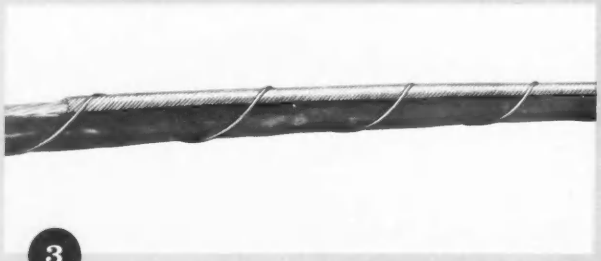
2

Preformed TRADEMARK **STRAND SPLICES**

. . . restore full mechanical strength to damaged or severed guy and messenger strand. You can see at a glance that they are installed correctly. Permit the spinner to travel over the splice without adjusting the gates or lifting the spinner over the splice.

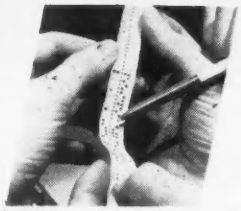


3

Preformed TRADEMARK **LASHING RODS**

economically secure cable to messenger. No rings, clamps, or other expensive equipment required. Installed without tools; remove and reuse if desired.

See all-product spread inside



"TRAFFIC LIGHTS" by D. A. PERIGO

I: Mark Sensing of Toll Tickets

The real test of the value of "Mark-Sensing" of toll tickets is its effect on your company's earnings. If you have questions concerning the value of "Mark-Sensing" to your operations this article will provide some practical answers.

AT THE very beginning of this discussion of Mark Sensing toll tickets we want to establish a very important point, namely, *something that may be right for one company may be completely wrong for another.* Because of some remarks this writer has made in various places, he has been looked upon as an opponent of mark sensing. We are not opposed to anything that is good for any company provided it does not adversely affect some other company. Likewise, we are very much in favor of things which are good for the industry, as a whole — but believe such things should be clearly explained without slanting or bias.

There have been many misunderstandings in connection with the economics of the mark sensing process. Most of these misunderstood items concern Accounting and Traffic.

We have heard many unusual figures quoted concerning the big savings in Accounting as the result of mark sensing. Analysis of some of these quotations reveals that these savings are generally the result of *mechanized revenue accounting*, of which mark sensing is only a small part. There are several Independent telephone companies whose billing processes have been mechanized for several years and are thereby already obtaining the major savings which others attribute to mark sensing.

Unfortunately the managements of some of these companies have looked at the quoted savings of other companies and climbed on the bandwagon, only to find the savings did not materialize. There was strong suspicion that their Accounting managements were not doing the job properly — whereas the actual fact was that they had been saving money for several years and couldn't save the same money twice.

We think it rather obvious that a small company which cannot justify mechanized accounting certainly cannot consider mark sensing its toll tickets or it will find itself tied up with some pretty expensive accounting machinery. This, of course, does not preclude the possibility of engaging the services of a Service Bureau or Processing Company. We are aware of some of the costs quoted by such companies, and as of now the rates are completely out of line for competition with either the large telephone company or the small manual accounting system.

Rating The Toll Tickets

ONE ITEM that makes a difference in an economic study of this problem is the rating of the toll tickets. It is a general practice in small offices to have the rating done by night operators, in what would otherwise be idle time. Therefore, if this job is transferred to the Accounting Department for a mark sensed operation it is costing more to get the job done — regardless of how little it might be.

Another consideration, of course, is whether you are using some form of automatic ticketing. This brings us face to face with a problem which will be discussed in a future article on Automatic Ticketing, but for now it is sufficient to say that automatic ticketing should be a part of mechanized accounting, but often is set up in such a way that tickets are prepared for manual billing.

All of these things seem to add up to the fact that as far as Accounting is concerned the volume of mark sensed tickets becomes the final determination of Accounting costs.

We then are faced with the realization that we are operating a company — not just the Accounting Department, so now let's take a look at the Traffic Department.

Some of the advantages listed for the Traffic Department are: (1) Eliminates the rating problem; (2) eliminates the charge quoting after completion; and (3) permits centralization of routing work.

We say flatly that all three of these claims are fallacious. Let's take them in order.

Where there is but one night operator required and she rates the toll tickets — there is no rating problem. There are offices with two night operators where the traffic pattern — late evening and early morning — is such that two are required and it is more economical to have two all night operators than to have a late evening and an early morning shift.

Beyond this point the rating prob-

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SUTTLE

EVERYTHING IN TELEPHONE PRINTING

No question about it! SUTTLE provides everything in telephone printing needed by the Independent Telephone Company. And, for fifty years the Printing Division of Suttle Equipment Corporation has been a leading printer of forms and stationery for telephone companies. Years of specialization together with the complete, modern equipment in the SUTTLE Lawrenceville, Illinois plant enable us to offer you printing work tailored exactly to your needs — at costs that save you money. Write us about your requirements for subscriber bills, toll tickets, accounting forms, snap-out or carbonized sets, R.E.A. forms. Ask for details on SUTTLE's cooperative directory printing plan.

SEND FOR NEW STANDARD FORMS PRICE LIST TODAY!

Serving the Communications Industry Since 1910

SUTTLE EQUIPMENT CORP.

401 North 15th St., Lawrenceville, Ill.
Lawrenceville 782
135 S. LaSalle St., Chicago 3, Illinois
DEarborn 2-3108

lem is frequently in the Accounting Department anyway. If it isn't, it is probably because the company has found it to be more economically done by Traffic. For example, Traffic finds it wise to over-schedule on the Rate and Route positions so a CLR operator is not held up in obtaining a route. This creates idle time which can be used to advantage in rating tickets.

The question of quoting charges when asked after the call is completed is a tough problem and telephone companies have been trying to discourage the practice for many years. The problem is not related to mark sensing. It just so happens that with mark sensing and elimination of ticket filing it is impossible to give this service. It, therefore, is improper to credit the mark sense operation with these savings for the very simple reason that, if a company wants to be tough on this subject, it can stop it anytime.

As to the centralization of the routing work, this can also be done without mark sensing. We know companies that are doing this — and they are not mark sensing. Again, we say, it is improper to credit these savings to mark sensing.

There is also one very important fact that should be obvious in all three of these items. None of them carries any weight in a small operation. The savings, whether credited to mark sensing or not, are related to large operations.

Mark sensing is an operation requiring considerable neatness and accuracy — and to function properly it takes time at the source — which is the Traffic Department. It seems significant that where Traffic offices have maintained their loads the Accounting savings are not as great as anticipated, but where the loads are lower, the Accounting Department receives a lower number of rejects.

We have heard it said that older operators don't like the system, so they make sure it doesn't work. We think such remarks decidedly unfair and completely unjustified. The problem is a basic one, and can be seen in the handwriting and other inac-

"They must'uv moved the cut-over date up . . . come to think of it, we *haven't* been very busy for a coupla' days!"

curacies. With regular toll tickets, however, the Accounting Department, and others, have failed to appreciate how many tickets are clarified by Traffic before they leave the central office. The proponents of mark sensing have assumed accuracies which do not exist.

There are many questions about loads and Traffic costs in connection with mark sensing which need to be honestly faced. There are also some problems with collect tickets and their handling. We'll discuss these items in the next issue. In the meantime, I'd like to receive your thoughts on the subject. Why not write them out and send your letter to me at TE&M, 7720 N. Sheridan Rd., Chicago 26, Ill.? — *D. A. Perigo.*

Tool-Line Bulletin

A NEW, 8-page fully-illustrated bulletin (E-240) issued by the Greenlee Tool Company describes tools of interest to the electrical, construction, telephone, and pipe fitting trades.

More than 60 Greenlee tools are covered including lightweight hydraulic conduit benders, hydraulic pipe pushers, cable pullers, radio chassis punches, hydraulic knockout punch drivers and sets, portable, high-pressure hydraulic power pumps and Greenlee's complete line of power bits, pipe bits, auger bits, chisels and allied tools.

Operating advantages, unusual features and complete size range are clearly listed for each tool. Copies of Bulletin E-240 are available through electrical wholesalers or by writing *Greenlee Tool Company, Dept. TEM, Rockford, Illinois.*

Wall Fastening Methods

HELPFUL information on attaching light and medium weight fixtures to walls is contained in a new bulletin, "Star Plastic Anchors." These anchors, designed to be used with either wood or sheet metal screws, provide quick fastening to walls.

Copies of the bulletin are available free by writing to *Star Expansion Industries, Dept. TE&M, Mountainville, N. Y.*

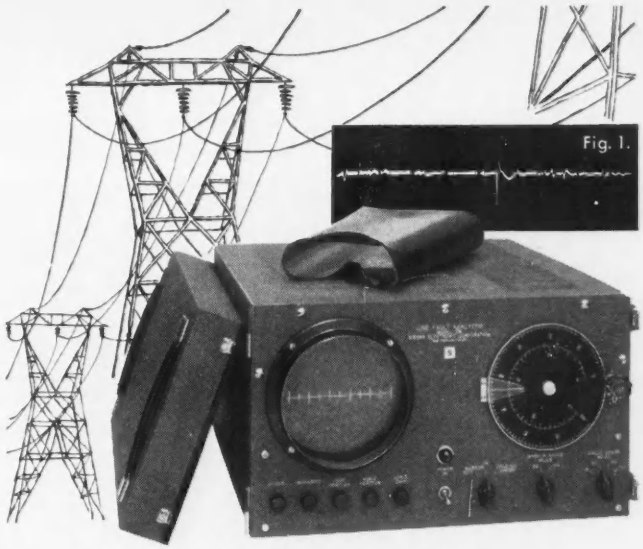


Figure 1. Display of 60 Kv line grounded at 27 miles.

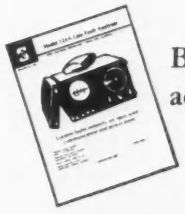
Locate circuit faults exactly ...½ to 200 miles distant

Communication and power lines
Use on any open wire line
Direct reading, simple to use
Use at carrier terminal, powerhouse, sub-station

Shorts, grounds or opens up to 200 miles away can be located within a few yards with the improved Sierra 124A Line Fault Analyzer. The instrument, operating on radar principles, sends a high amplitude pulse along the line under test. Discontinuities, even capacitors and transformer banks, appear clearly; a complete picture of the line and its condition appears on the radar-type "A" scope.

Two Pulse Widths

To insure maximum readability, two pulses — a 1 microsecond, 1,000 volt pulse or an 8 microsecond, 500 volt pulse —are provided. Other features include a sweep delay, movable distance step, sweep repetition rate of 60 cps and a high intensity flat faced cathode ray tube. Provision is made for camera attachment to the scope face.

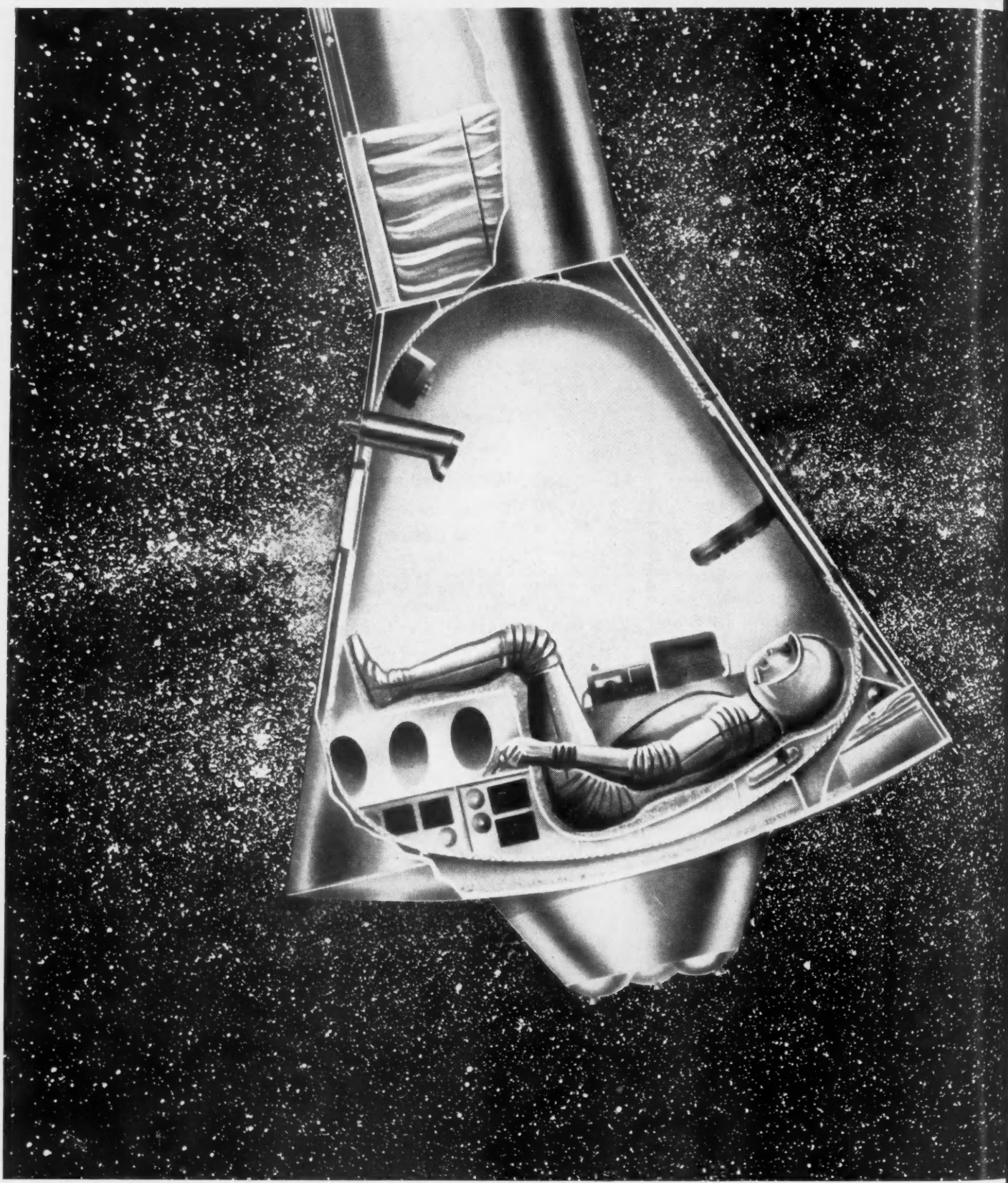


Bulletin gives details, actual utility operating experiences

Data subject to change without notice.

Sierra Electronic Corporation
A Division of Philco Corporation
4695Y Bohannon Drive • DAvenport 6-2060
Menlo Park, California, U.S.A.
Sales representatives in Major Cities
Canada: Atlas Instrument Corp., Ltd., Toronto, Montreal, Vancouver
Export: Frazar & Hansen, Ltd., San Francisco, New York, Los Angeles

WESTERN ELECTRIC AND



PROJECT MERCURY SPACE CAPSULE, being developed by the McDonnell Aircraft Company, will orbit the earth with a human pilot. Western Electric was selected by the National Aeronautics and Space Administration to head up the industrial team that is building the world-wide tracking and ground instrumentation network necessary to keep in contact with the space capsule.

SPACE-AGE COMMUNICATIONS

As the space-age becomes a reality, Western Electric's arsenal of communications experience continues in the service of the nation . . . tracking astronauts and missiles in space and shielding the nation with far-flung electronic networks.

ecause of our vast background in handling complex electronic id communications projects for the Bell Telephone System, the overnment has selected Western Electric as prime contractor on tal military communications, defense and tracking networks.

With high-speed intercontinental bombers in the '50s came the gent need for electronic warning systems. When the Air Force cided to build a fence of radar stations across the Arctic, West- n Electric was named prime contractor and completed the mas- ve project in just 32 months. This Distant Early Warning (DEW) ine—since extended to the Aleutian Islands and soon across reenland—will stretch 5,000 miles in our defense.

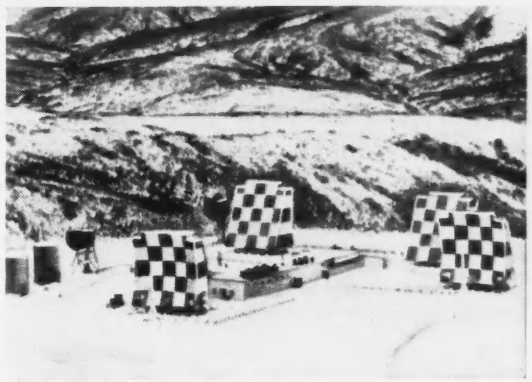
We have also been asked to provide management services for e construction of the Semi-Automatic Ground Environment SAGE) System and to design and build the rearward communi- tions for BMEWS. SAGE will be a complex of inter-connecting mputers, radars and other equipment making up electronic round environment in each Air Defense Sector. BMEWS will se long-range radar installations for rapid warning and precise, ajectory predictions of enemy ballistic missiles.

W.E. has been recently named by the National Aeronautics and pace Administration to lead an industrial team which is engi- eering and installing the global tracking and control system for anned space vehicles. This is "Project Mercury," planned for ext year to orbit an astronaut 120 miles in space.

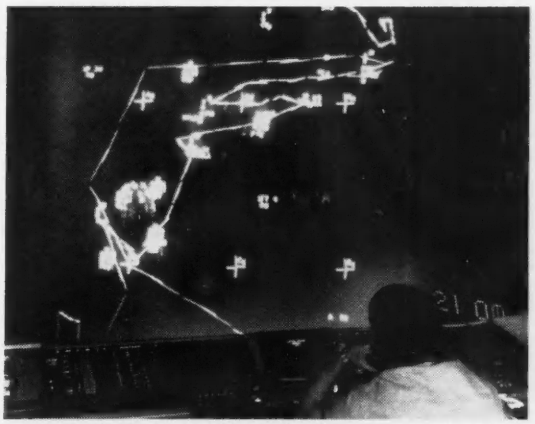
We at Western Electric are indeed proud to help provide the nited States with the best military communications, warning, and acking systems that modern science can achieve.

Western Electric

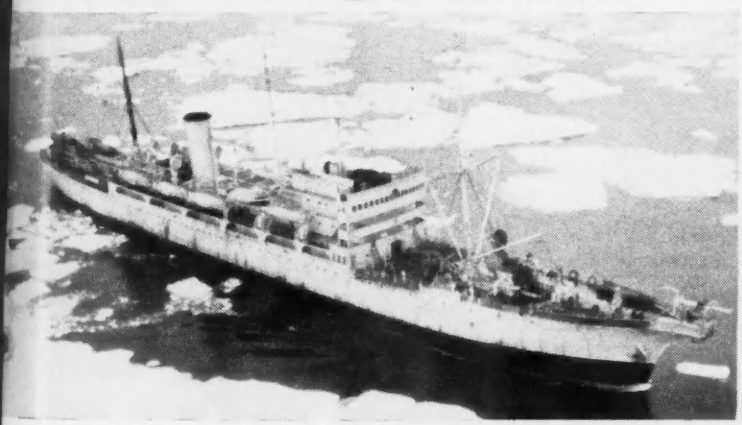
MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM



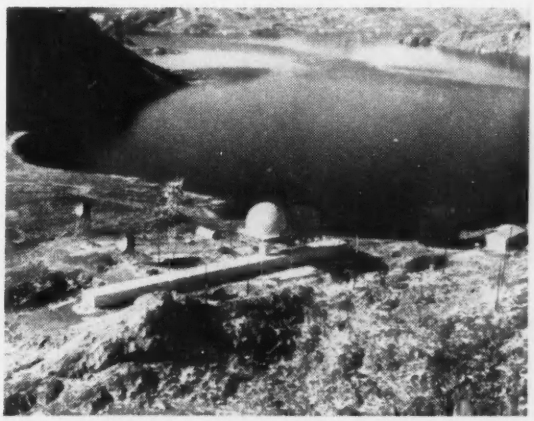
WHITE ALICE STATION perches among some of the roughest terrain in northwestern Alaska. Built by W.E. for the United States Air Force, the 33-station system provides Alaska with greatly improved military and civilian long distance communications.



SAGE PROJECTION SCREEN presents situation display to Sector Commander at Semi-Automatic Ground Environment direction center—allowing a potential enemy air attack to be quickly detected and missiles and fighter aircraft directed to selected targets.



BMEWS SUBMARINE CABLE is laid by HMS Monarch in the remote, ice-choked ocean north of the Arctic Circle. Western Electric was assigned the responsibility for development and construction of the rearward communications for the Ballistic Missile Early Warning System.



DEW LINE STATION on Baffin Island is part of the largest single defense system ever constructed —an operating radar system across the top of North America, having its own communications network.

New Products' Showcase

SUPPLIES AND EQUIPMENT

By DICK REYNOLDS

Bus Brown Trencher

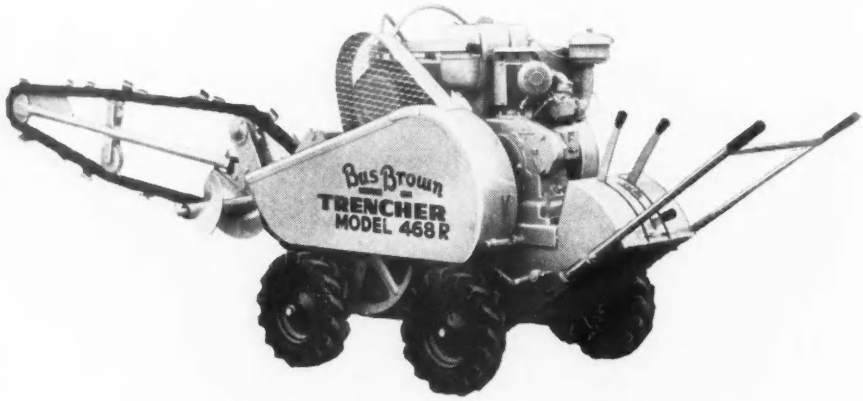
THE BROWN Manufacturing Co., Inc. is marketing a new and larger model of its Bus Brown Trencher.

The new trencher (Model 468R) weighs 350 pounds more and offers more trenching width than its predecessor (Model 346). It will offer variable trenching speeds up to 12 feet per minute and will trench ditches up to 12 feet wide.

The model retains the 4-wheel drive of the earlier model. Another feature of the trencher is the balancing on the two front wheels for easy steering while moving forward and loading.

Specifications on the trencher have been improved for the digging jobs it performs, such as digging water lines, gas lines, underground electrical wiring, lawn irrigation ditches, installing underground telephone cables, signal cables and laying out limits for excavations.

Powered by a 12-horsepower Wisconsin engine, the Bus Brown Trencher (Model 468R) is also equipped with a hydraulically controlled digging boom that can be raised to an upright position. *Check NP* 411.



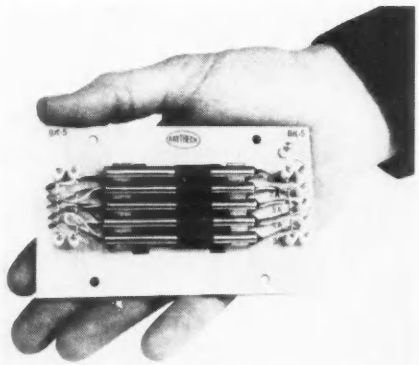
Model 468R Bus Brown Trencher.

Bandpass Filters

A NEW magnetostriction bandpass filter developed by Raytheon Company's Industrial Components Division enables unlimited combinations of parallel bandpass filter arrays to be constructed with center frequencies spaced one bandwidth apart anywhere in the 45 to 50 KC range. These new filters provide a half-power bandwidth of 3 cps with resonant frequencies between 45 and 50 KC. At 50 KC center frequency can be adjusted within 0.3 cps.

The bandpass filters are designed for applications requiring multiple, narrow-band filter channels for frequency analysis or as frequency determining elements. Typical uses are in shock and vibration test equipment, spectrum analyzers, sonar equipment, telemetering equipment, and wireless paging systems. A bank of ten filters mounts on a 7″ x 3″ panel and weighs only 12 pounds.

These filters withstand shocks of 50 Gs and mechanical vibration to

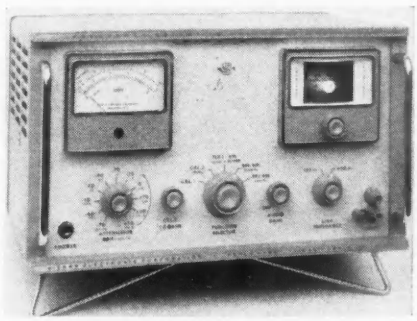


500 cps. Stability is maintained over wide temperature extremes, between, —60 degrees C. and +80 degrees C. Maximum resonant frequency variation is only 8 ppm per degree C. Input and output impedances of 15 and 600 ohms, respectively, are ideally suited to transistor circuits. *NP* 412.

Frequency Selective Voltmeter

SIERRA Model 125A voltmeter covering the 3 — 600 Kc frequency range is of modular construction, incorporates two selectivity settings and a flat voltmeter position.

The narrow selectivity bandwidth is 250 cps wide at the 3 db points, and 1 Kc wide at the 45 db points. The broad selectivity bandwidth is 2.5 Kc wide at the 3 db points and 6 Kc wide at the 45 db points. Accuracy on both bands is ±2 db in level measurement. The accuracy of frequency measurement is ±500 cps from 3 Kc to 10 Kc,± 1 Kc from 10 Kc to 100 Kc, and ±2 Kc from 100 Kc to 600 Kc. Line measurements can



be made at either 135 ohms or 600 ohms balanced or unbalanced.

As a frequency selective instrument, the Model 125A has a measurement range from — 90 to +32 dbm. as a flat voltmeter its measurement range is —20 to +32 dbm. *Check NP* 413.

Universal Ground Anchor

A NEW Universal Ground Anchor, by Bartlett Manufacturing Co., need not be driven into the ground at an angle conforming to that of the external load, as it is a self-aligning anchor due to its design. It can be

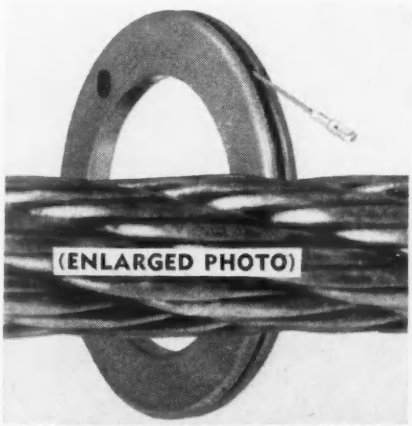
utilized for frozen ground, ordinary soil, or desert land, and is available for loads ranging from 1,000 lbs. to 30,000 lbs.

The anchor comes in eight different sizes and may be driven into the ground manually in less than three minutes, or less than 30 seconds when using a small pneumatic hammer with a special adapter tool. *Check NP* 414.

Flexible Fish Tape

A NEW flexible round fish tape for jobs using aluminum conduit is now being introduced by Ideal Industries, Inc.

Called "Flexi-Strand," it is made



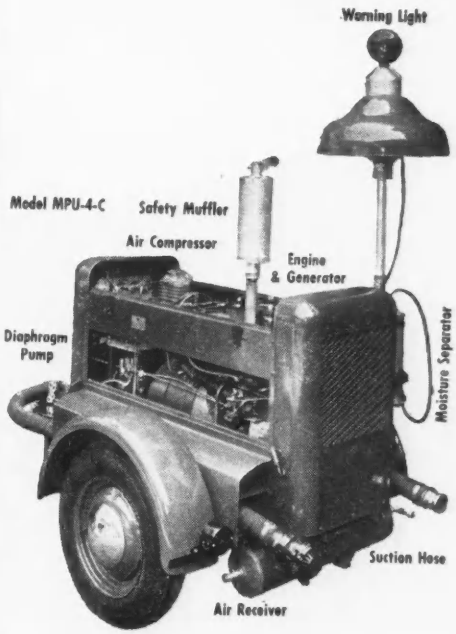
of galvanized aircraft cable. It is smooth, and has no sharp edges to gouge or cut into soft conduit. Its flexibility will take sharp bends in

YOU CAN HAVE

S&G

A POWER AND PUMPING PLANT

THAT GOES ANYWHERE



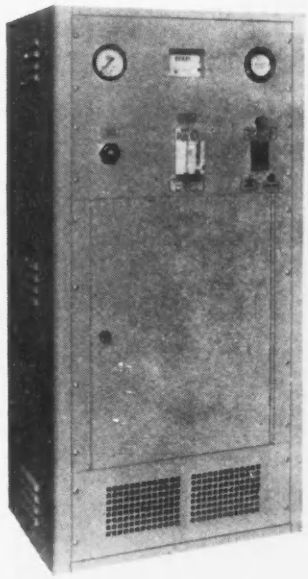
MOBILE POWER UNIT

- Generator slow speed for quietness
- Pump—Diaphragm type to remove seepage and drain back
- Air Compressor — to put cables under pressure for cutovers of repairs
  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cutovers, flash testings, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

MODEL A Air Compressor Dehydrator

Exchange equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 30 cables. The unit is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

- Completely automatic in operation
- Air Purifier to eliminate oil mist
- Incorporates the latest safetly devices.



write or phone

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • JAckson 5-3142

WILKINSON LINE LOCATOR

Pat. Pend.

WILKINSON PRODUCTS COMPANY

3987 Chevy Chase Drive, Pasadena 3, California

TEL: SYlvan 0-4314

MINIATURIZED PRECISION
WILKINSON LINE LOCATOR Model W-3

A radically new, advanced design in electronic locators for all sub-surface installations — transmissions and distribution lines, cables, valve boxes, buried structures under ground and in walls.

True miniaturization has been made possible by use of transistors, subminiature batteries, components, etched circuitry and transistorized single ear set.

GENERAL SPECIFICATIONS

Size: Receiver — 8″ x 3½″ x 2½″. Transmitter 8″ x 3½″ x 2½″. The set also includes a substantial carrying case. The head set is a single ear transistor type.

Weight: 4 lbs. total, including transmitter, receiver and telescopic connecting handle.

Instrument Cases: Molded glass fibre construction.

Power: High gain type, highly sensitive and accurately controlled.

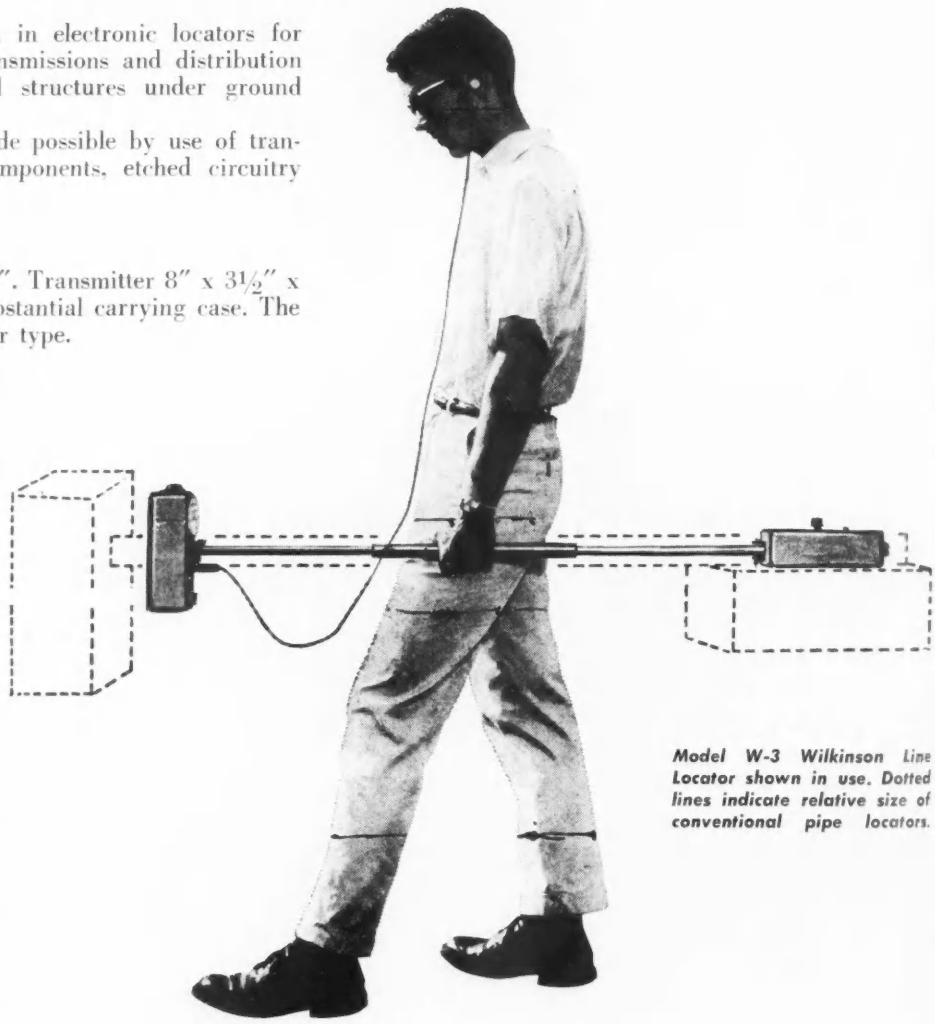
Battery Life: The over-all battery life is ten times that of the conventional locating devices previously available. Mercury "A" cells, non leak miniature size.

Circuitry: The circuits are etched instead of hand wired.

Antennas: New and unique application of miniature "Q"-core antennas.

Shock Resistance: The glass fibre cases, soldered-in transistors, etched circuits and secure mounting of miniature components eliminate the usual hazard of shock common to the previous type locators.

Maintenance: The Wilkinson Line Locator Model W-3 is virtually maintenance-free because of its advanced mechanical and electronic design. The transistors have a rated life of approximately 70,000 hours use. Transistors, resistors and capacitors are soldered into the circuit.



Model W-3 Wilkinson Line Locator shown in use. Dotted lines indicate relative size of conventional pipe locators.

The compactness and light weight of the Wilkinson Line Locator Model W-3 . . . its miniaturization and extremely high sensitivity provide users the ultimate in line locating instruments. It can be used in very close quarters . . . for detecting and tracing cables, pipes and the like in wall installations. Because of its light weight, operators do not experience fatigue. The W-3 functions both inductively and conductively, separated, or assembled on the handle.

Distributors in Principal Cities. Descriptive brochure upon request.

aluminum without cutting, and also take extreme flexing without kinking or taking a set.

It withstands up to 1500 lbs. pull test and is equipped with an extra large eye to accommodate the following wire: 20 No. 14, 15 No. 12, 10 No. 10, 4 No. 8 and 3 No. 6. *Check NP* 415.

Aerial Beam

AN AERIAL beam, insulated from ground to withstand in excess of 50,000 volts, has been added to the Sky-Master line of aerial equipment manufactured by McCabe-Powers Body Company. The unit, designated the Series ABS Sky-Master, is designed to enable workmen to reach overhead areas quickly and to work on or near energized lines in complete safety.

Movement of the independently-

controlled beams and rotating support mast is hydraulically powered, through the truck engine or an independent power source. Outer beam can be positioned at any point in a 270-degree arc, inner beam can be moved to any point in a 110-degree arc and mast can be turned continuously in either direction. Work basket can be spotted in an indefinite number of positions in all directions from the truck.

The Series ABS can be used at

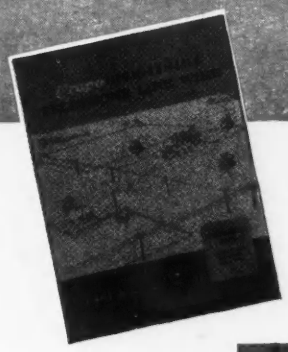
Crapo HTL-135

EVERYTHING YOU NEED IN A GOOD RURAL TELEPHONE WIRE

Ample Conductivity
Superior Strength
Dependable Life
Low Cost

When you or your engineers specify a telephone wire for rural lines you want to be sure that it will fulfill every practical requirement yet be economical to install and maintain. Crapo HTL-135 High-Tensile Line Wire was conceived and developed with that purpose in mind. Its voice transmission and ringing qualities are excellent for subscriber loops in typical rural systems. Its superior physical strength and its fatigue endurance make posible long-span, low-cost construction with an adequate margin of safety and a minimum of maintenance.

Comparative cost studies show that substantial savings can be realized by building rural lines with Crapo HTL-135. For dependable and economical performance, insist upon this reliable, time-proven conductor!



WRITE for Engineering Manual TM-59 containing Sag and Tension Data, Staking Tables and Guying Tables.

Crapo HTL-135
INDIANA STEEL & WIRE CO., INC. MUNCIE, INDIANA U.S.A.

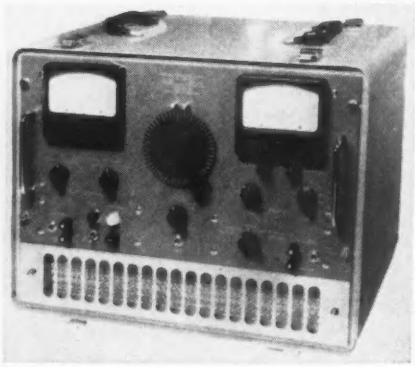
INDIANA STEEL & WIRE CO., INC.
Muncie, Indiana

speeds as fast or as slow as the operator desires. Safety devices prevent unwanted movement when controls are in neutral or if damage to hydraulic system occurs. *Check NP* 416.

Transmission & Delay Measuring Set

ACTON Laboratories Inc. has introduced a new compact Transmission and Delay Measuring set in one cabinet.

The set is designed to measure the attenuation and relative delay char-



acteristics of transmission lines, lumped constant networks and other transmission systems having characteristic impedances of 600 ohms. Measurements may be made over a carrier frequency range from 500 cps to 50 kc. The instrument has an over-all precision and accuracy of delay measurement of ±5 microseconds.

The Type 453-A is designed for mounting on a standard 19″ rack. The combined units have the following dimensions: 13½″ high x 19″ wide x 14″ deep.

The cabinet has the following dimensions: 14″ high x 22″ wide x 15″ deep. *Check NP* 417.

Positioning Cylinder

HOLAN Corporation is making available a transverse positioning cylinder for use on the Holan 6800 Derrick with all Holan hydraulic earth borers.

The new positioning cylinder enables operator to move the digger sideways. It becomes a working companion of the "fore and aft" or longitudinal positioning cylinder which has been available for use on the 6800 Derrick for some time.

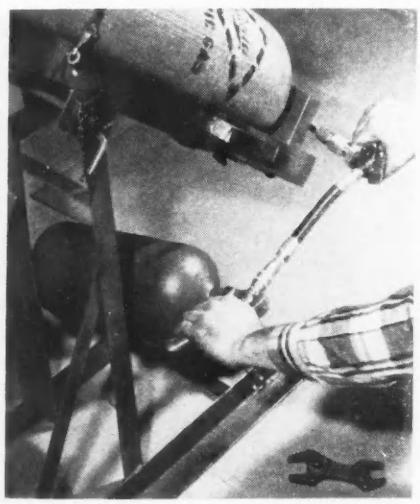
Sideway travel of the digger makes it possible to bore at curbside with the truck parked at a shallow angle, thus eliminating blocking of street traffic. From the centerline of the

derrick, the transverse positioning cylinder will move the digger 11″ to the left side and 29″ to the right or curbside. With a transverse positioning cylinder, holes can be bored close to a standing pole or any other obstruction. *Check NP* 418.

Portable Refill Unit

A PORTABLE Refill Unit which makes possible on-the-job or in-shop recharging of Jet Line Cylinder bottles has been introduced by Jet Line Products, Inc.

The Jet Line Cylinder provides a method of laying a nylon line through ½″, ¾″ and 1″ conduit. This tool



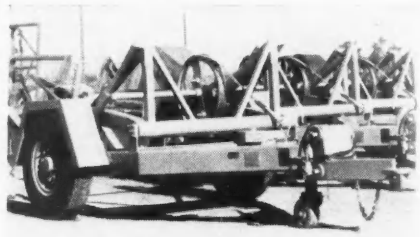
employs high-pressure expansion of a harmless gas to propel a light line package through the conduit; one filling of the Jet Line Cylinder pressure bottle will deliver approximately 100 conduit shots.

The Jet Line Portable Refill Unit consists of (1) a pressure supply tank filled with the special Jet Line Gas; (2) a tilting rack for the tank; and (3) a valve and filling assembly. *Check NP* 419.

Reel Carrying Dolly

PETERSEN Engineering Co., Inc. has announced the addition of a straddle-type reel carrying dolly for use on any kind of line stringing operation.

The Model 6100 HLRC Pengo reel carrier will take any reel up to 46″ wide by 84″ in diameter and weigh-



ing to five tons. It is self-loading by means of a manually operated hydraulic system.

This unit embodies a front tow hitch for towing behind either truck or tractor, with or without winch. A smaller unit of similar design is available, as in a larger unit. *NP* 420.

Electric Converter

THE TERADO Trav-Electric Supreme converter illustrated below is made to transform 12 volt battery current to 110 volts AC with a capa-

city of 200 watts. On this converter can be operated tape recorders, portable television, phonographs, dictation machines, radios, mixers and

blenders, electric razors, and many other electrical devices.

The Supreme comes complete with remote control for under dash installation. It has an AC outlet, five position switch, and an indicator light. This unit is fan-cooled and it measures 11″ x 6″ x 6″. Adequate cord and remote control cable is complete with the unit for installation in the trunk of the car.

Other converters with wattage capacities starting at 15 watts are also manufactured. *Check NP* 421.

Molded-Mylar Capacitors

A NEW kit of molded Mylar capacitors has been announced by Cornell-Dubilier Electric Corporation.

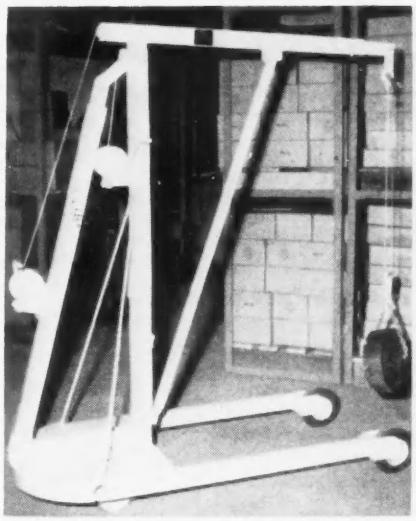
Called the "Hit Kit," this new package contains a smaller sized version of an earlier larger service-shop

sized kit. The kit consists of 35 "PM" capacitors, in seven most-used values packed in a plastic box that can double as a spare parts box. *NP* 422.

Shop Crane

A NEW multi-position high lift portable crane has been developed by the Thern Machine Company for lifting and moving heavy or awkward loads for marine and general shop use. With mast and boom fully extended the "High Boy" will lift weights up to 750 lbs. to a height of 11 feet. Mast and brace telescope is one unit and are raised up or down by a hand winch mounted on the mast. The boom brace automatically moves with the mast.

The unit is easily moved through standard doorways when boom is retracted to fully horizontal position. Maximum lift capacity is 1250 lbs.



with boom fully retracted to 34″ and mast and brace fully retracted to lifting height of 8′ 8″. Positive spring loaded ratchet lock assures safe operation and holds load at any position. *Check NP* 423.

RF Millivoltmeter

AN ALL transistorized, portable Audio-RF Millivoltmeter, providing accurate measurements down to 100 microvolts over a frequency range of 20 cps to 20 mc, has been introduced by Motorola. The battery operated meter has full scale readings in 12 ranges from one millivolt to 300 volts.

The instrument has a built-in video amplifier for simultaneous use with meter to drive an oscilloscope, or wherever a highly stable broadband amplifier is needed. Operation from standard "D" flashlight cells eliminates any AC line connection and corresponding power line noise and interference and ground problems. High input impedance of 10 megohms shunted by seven micromicrofarads is provided in the one to 300 volt

ranges, and input impedance of one megohm shunted by 14 micromicrofarads is provided in the one to 300 millivolt ranges.

The new instrument, supplied ready to operate with batteries and probe, is 10 inches wide, 5¾ inches high and 5½ inches deep. It weighs 10 pounds. *Check NP.* 424.

Fire Protection Pump

NEW PORTABLE Rice Fire Protection Pumps include complete range of sizes 1½″ thru 3″. Also they feature positive automatic priming by combining a self-priming pump with an exhaust primer, high head performance without extreme close tolerances for sand laden water to wear, and light weight aluminum or cast iron construction.

Units are powered by heavy duty, easy starting four cycle engines. Write for free specifications and prices. *Check NP* 425.

NEW PRODUCTS' DEPARTMENT **4-15-60**
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Please send me additional information concerning the following New Products.

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NP 416.....	NP 417.....	NP 418.....	NP 419.....	NP 420.....
NP 421.....	NP 422.....	NP 423.....	NP 424.....	NP 425.....

NAME..... POSITION.....

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*c/o Chase Copper & Brass Co.

"SAFETY"

(Concluded from page 58)

people in the community in the same principles of defensive driving. The telephone company may sponsor a plan of this kind with aid of the local Safety Council and the city and business groups.

Home Safety

ACCIDENT prevention in homes is just as important. Here the employe can bring his own safety training principles into play by enlisting the support of his wife and children in accident prevention programs with meetings held from time to time just like at work.

Good safety attitudes should be emphasized at the family meetings. The importance of alert thinking to detect hazards should be brought out. For example, children should be taught to think of the consequences of leaving things like roller skates on stairs and bicycles on the sidewalk, and running across streets without looking first to make sure no vehicles are approaching.

Effects of First Aid Training

IT HAS been proved time and again that first aid training has a very definite influence on the promotion of accident prevention. Telephone employes who know first aid principles show a good attitude largely as a result of a desire to prevent injuries. They have learned the severe effects that injuries can have on the accident victims. A trained first aider generally has the reputation of being free from accidents to a greater degree than others who have not taken the training.

Many telephone employes who have completed the beginning and advanced first aid course work become instructors and exert an important influence in the spreading of first aid principles among members of their communities.

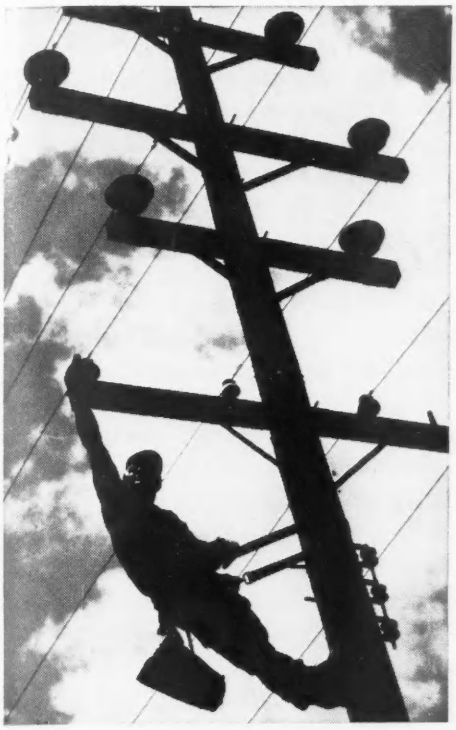
In the matter of stimulating community interest in accident prevention, telephone people may promote spare time safety projects such as the use of automobile seat belts, the establishment of safety patrols at schools, and the putting up of signs or signals at dangerous intersections. As in the case of defensive driving for the public, business and social groups may be contacted and discussions promoted on safety subjects.

Conclusion

ACCIDENT prevention is injury prevention, off the job or on the job. It is certain that when off-duty injuries are reduced to the very minimum possible, along with freedom from injuries incurred at work, the morale of the employes will be higher, company operating costs will be reduced, and the company itself will experience good public relations.

All these will come about when each and every individual acquires a consistently good attitude toward accident prevention, and safety becomes a "way of life," to be practiced at all times. — *Myrle Shafer.*

How can you cut down on telephone pole maintenance?



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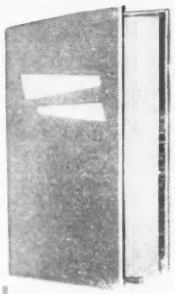

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A PUBLIC ANNOUNCEMENT SYSTEM

(Continued from page 60)

locking circuit to the C lead through contacts 11 and 12 of the E relay.

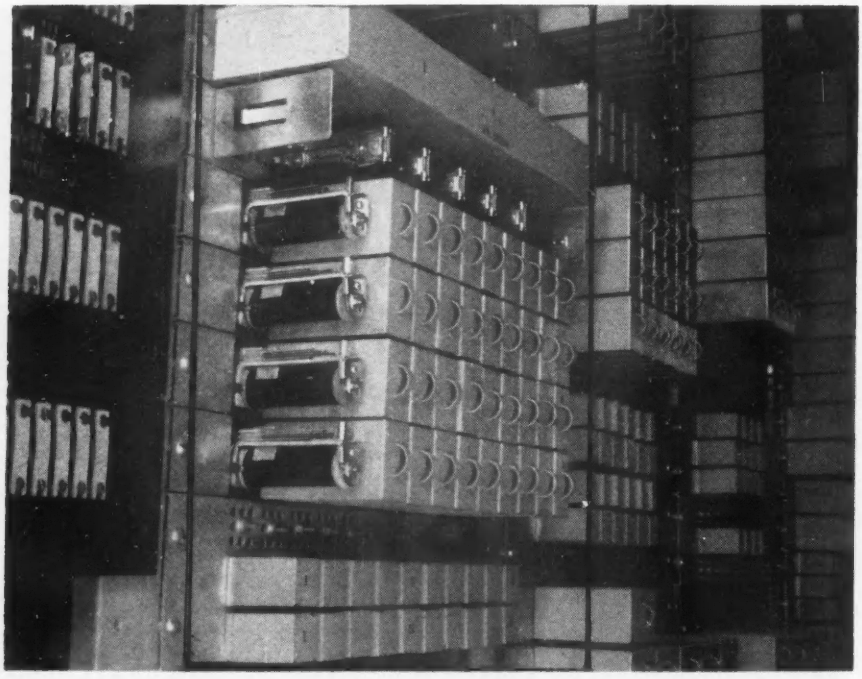
Operation of the D relay closes the R lead path through contacts 12 and 13 of the D relay and also prepares a circuit for the E relay through contacts 14 and 15.

The E relay will momentarily operate when a pulse of ground is received from Time Pulse Lead 3. Seizure also extended ground from the C lead through contacts 23 and 24 of the A relay (prior to full operation) to the F relay (slow to release) which operates and closes a holding circuit through its own contacts 32 and 33 and 21 and 22 of the C relay. Operation of the F relay closed a second and parallel path in the R lead, closed a path to the C relay through contacts 14 and 15 to the Time Pulse Lead 1 and, through contacts 22 and 23, placed ground on the Tone and Timer Start Lead (TSL).

With the T and R paths closed, the subscriber is connected to the equipment shown in *Figure Two.* He can then hear the announcement which was previously recorded on the tape recorder. This announcement is fed out through a cable pair from the newspaper office to a common bus in the central office, a 15 db attenuation pad, and the induction coil. Purpose of the 15 db attenuation pad is to present a minimum of 30 db between two subscribers simultaneously connected to the equipment. This prevents subscribers conversing with each other but still allows them to hear the announcement from the recorder.

Plant battery is fed through a 15,000 ohm resistor to a 150 microfarad condenser. This allows the condenser to charge to full plant battery value. Relay G is also connected to the battery side of the condenser. At the time the A relay operated, ground was placed on the C (1) lead, which allowed the condenser to discharge through the relay, allowing the relay to momentarily operate and release when the condenser was sufficiently discharged. As long as the ground remains on the C (1) lead, the condenser cannot recharge to plant battery, due to the 15,000 ohm resistor and, therefore, the relay will only operate once on each seizure of the circuit.

The operation of the G relay caused a momentary pulse of battery to be impressed upon the M lead. This lead connects through one side of a cable pair to a peg count meter in the subscriber's office. The pulse of the battery causes the meter to register. Battery is also placed on the M (1) lead, through variable resistor R2 to a similar peg count meter in the central office. Resistor R2 is adjusted to the same value of resistance as that of the single conductor to the subscriber's peg count meter.



The equipment can be mounted on standard relay racks. In this photo, the components of FIG. 1 can be seen (between the outlines). A relays are at the top, followed by a horizontal row of C relays, then a row of D relays, etc. Some dust covers have been removed for better clarity. Condensers are in the bottom rows.

Automatic Removal Of Information

THE original design did not incorporate the provision for automatic discontinuance of information after a reasonable length of time. This meant that any subscriber could seize the equipment and retain it as long as he allowed his telephone to be in the "off-hook" condition.

This presented no problem until the first election came along. At that time, the "sharpies" in some of the local taverns quickly discovered that they could seize the equipment, early in the evening, and hold it the rest of the night. In that manner, they were able to get local election results, go back and have a few more beers, and then return and still have new information flowing in on the circuit.

This was fine for the lucky fellow who first seized the equipment; however, it quickly tied up all ten of the circuits which we were providing. As a result of this experience, the additional feature incorporating the automatic opening of the R lead was added.

Experience indicated that the ideal time to be allowed each subscriber should be no less than thirty seconds and, ideally, no more than approximately ninety seconds. An examination of the timing signals received from the Tone and Timer equipment indicated that "splashes" of ground are available every thirty seconds.

The sequence of these timing signals is shown graphically in *Figure Four.* When a splash of ground is received on the TP3 lead, the E relay

operates, opening holding ground. through contacts 11 and 12 of the E relay, to the D relay. D restores, opening one of the parallel paths in the R lead (contacts 12 and 13 of the D relay).

Nothing further happens until the splash of ground arrives on the TP1 lead. This ground causes the C relay to operate and opens the holding circuit to the F relay, which restores. Restoration of the F relay completes the opening of the R lead and prevents the subscriber from hearing any further information from the tape recorder.

Since subscribers can seize the circuit at any particular point in the timing cycle, it was necessary to make certain that subscribers would not be disconnected within a few seconds if they happened to seize the circuit at, or slightly prior to, the interval when splashes of ground arrive on TP1 and TP3 simultaneously.

By margining contacts 33 and 34 of the E relay to make before contacts 21 and 22 of the C relay break, a path to the F relay is maintained during such instances and F does not restore. Consequently, the circuit always functions in such a manner that the D relay is always first to restore and there can be no cases of subscriber disconnect prior to a thirty second interval.

In actuality, the timing is such that subscribers obtain information for a minimum period of thirty seconds and a maximum period of slightly less than 150 seconds.

The circuit will remain seized, by the connector, as long as the subscriber holds the switch train. However, it has been our experience that when subscribers hear the tape recorder information discontinued, they hang up, which releases the trunk hunting connector which, in turn, removes ground from the C lead allowing A to restore and the circuit is ready for additional calls.

The illustrations show the equipment in its final form and as finally installed in the central office. There are a multitude of methods and ways in which the equipment can be mounted and installed and, in fact, about any available rack space can

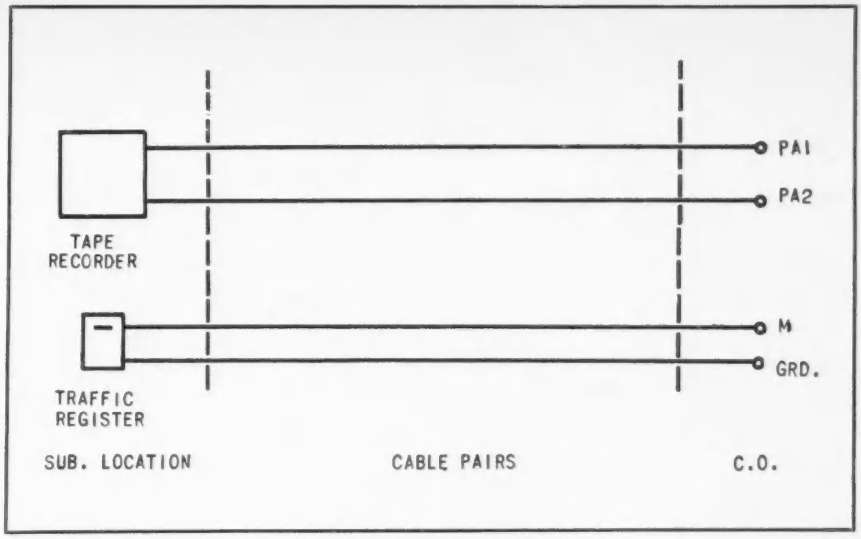


FIGURE THREE.

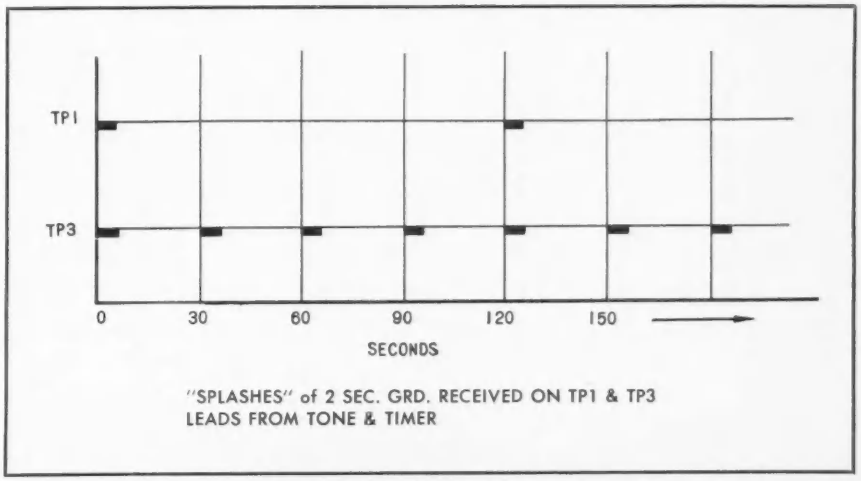
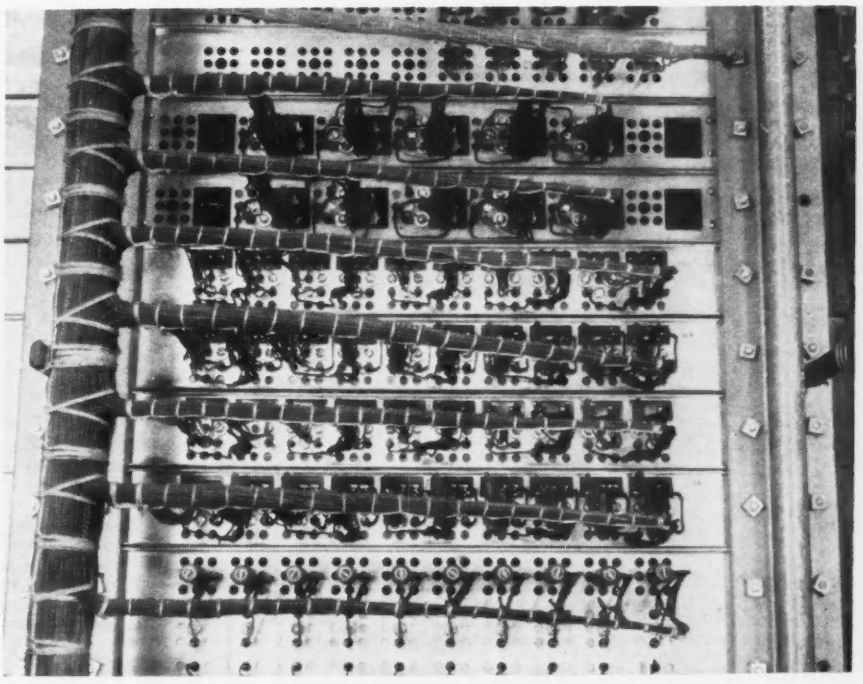


FIGURE FOUR.



Standard cable and mounting arrangements can be used, as shown in this rear view of the equipment shown in FIG 1. Resistor R1 can be seen in the bottom, horizontal plate.

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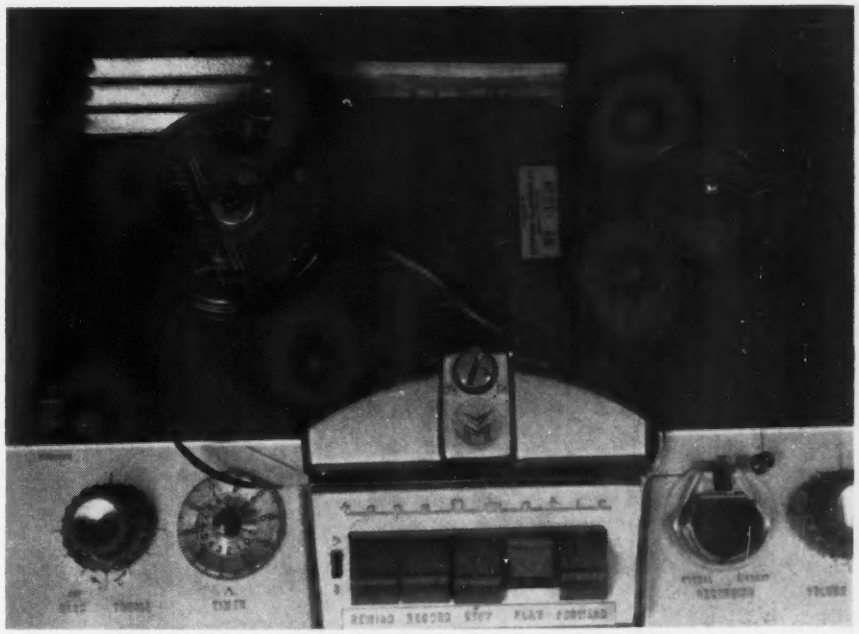
be utilized for such an installation as is usually the case, each job must be more or less custom-tailored to suit the occasion.

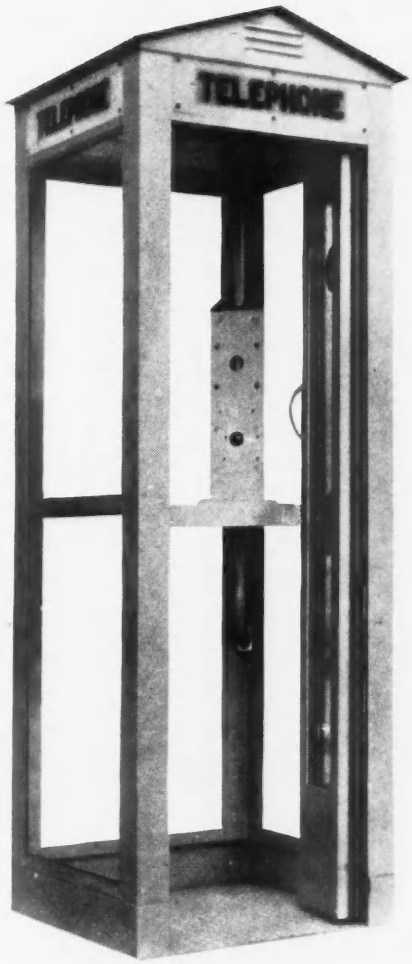
The actual tape recorder can also be seen in the illustrations. It is a common type of recorder with no special features except for the tape. A continuous tape reel, manufactured and supplied by Cousino, Inc., 2325 Madison Ave., Toledo 2, Ohio, is used in place of the normal reels. The tape was cut to a 60 second length. Normally, a 30 second message is used and two messages are placed on the tape.

This unit is one in which many had their "finger in the pie" and all contributed to the design and construction. *Marion Heare, Richard DesJean, Chester Heare, Bill Shepherd,* of the *Citizens Telephone Co., Walter Lawrence* of *Automatic Electric Sales Corporation,* and I, all managed to get in our nibs and add a suggestion here and there. I doubt if there is anything very original about any of the circuits involved; however, it has certainly performed a "bang-up" job for us and its design and construction provided a pleasant break in the usual central office routine. — *C. D. Ehinger.*



A standard tape recorder is used in conjunction with an endless tape mechanism. This photo shows the tape unit on a VM recorder.

Any comments, criticisms, or suggestions for future topics? Address all correspondence to "Sub-Harmonics and Overtones," Telephone Engineer & Management, 7720 Sheridan Road, Chicago 26, Ill.



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* Wire Glass All Around.
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* Shipped All Assembled for Your Location.

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Printed by
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350 East Twenty-second Street, Chicago 16

NEW EQUIPMENT

(Continued from page 48)

automatically locking the aerial beam in position.

The work basket is made from non-conductive, reinforced plastic material and is attached to an insulated shaft on the outer beam. By means of a linkage of rods, chains, and sprockets, the floor of the work basket is held in a horizontal position throughout the movements of the aerial beam.

Outriggers are installed on each side of the truck body to provide stability regardless of the position of the aerial beam. These supports are extended and retracted hydraulically through independently controlled levers.

An important safety feature of the aerial beam illustrated is the provision of pilot-operated check valves installed at each cylinder port to maintain the position of the work basket in case of failure of the hydraulic lines. This aerial beam has a safe load capacity of 250 pounds in all positions with a safety factor of five.

Figure Two illustrates a typical use of an aerial beam on an emergency tree removal job.

Another type of articulated arm aerial lift is shown in *Figure Three.* This unit operates through a hydraulic system with precise aircraft type controls which enables exact spotting of the work "buckets." A solid insulating fiberglass section is utilized in the upper arm and the control and leveling cables are equipped with fiberglass inserts for complete insulation from ground contact.

According to information furnished by the manufacturer, the fiberglass section successfully withstood 100,000 volts for one minute in a bucket-to-ground test. Also, in a strength test, the section required a 6,200-pound load at end before failing, a safety factor in

FIGURE 10: — "Pole Planter" light duty derrick and digger unit. Winch and digger are operated by hydraulic motors. (Hydra-Flex, Inc.)

YOU ASKED FOR IT!

the NEW DAVIS Self-Propelled T-66 Trencher is built to your specifications

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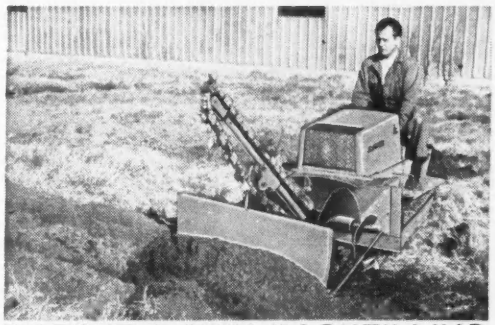
features

POSITIVE TRACTION...HYDRAULIC VARIABLE SPEED DRIVE CONVENIENT CONTROLS...VIRTUALLY EFFORTLESS OPERATION



DOES IT S OWN BACKFILLING

The Davis T-66 has a low-cost, well-designed, hydraulically controlled angle backfill blade. The T-66 has two-speed drive with instant forward or reverse, powered steering, independent left and right positive clutches and disc steering brakes for maneuverability in backfilling operations.

The new, self-propelled, crawler-type Davis T-66 is the most advanced utility trencher available. It's designed and produced after an exhaustive survey revealed the features users really wanted. Every one of its 1350 pounds is packed with performance to handle 9 out of 10 jobs with amazing efficiency and economy; yet, it's priced much less than you would expect.

Positive traction, accurate speed control, hydraulic variable speed drive, hydraulically operated boom, preloaded shock-absorbing boom, convenient — virtually effortless — control, and compact design (only 37″ wide) are just a few of its 33 profit-producing features.

It digs 3″ to 4″ wide to 66″ deep or 12″ wide to 30″ deep, and at varying depths and widths in between. It trenches from 1-ft. to 12-ft. per minute depending upon soil conditions. Only **two** different **tooth combinations** are required to **handle all digging widths.** The Davis T-66 is quality built in every part.

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the DAVIS PUP TRENCHER digs by itself!

Digs where others fail because it's self-propelled by positive, 6-speed winch drive. Digs 2″ or 3″ wide to 36″ deep; 4″ wide, 18″ deep. Proven to be profitable. Low cost.

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Designed to carry T-66. Versatile for many uses. Has 2000 lb. capacity, 48″ x 84″ deck, low center of gravity and load equalization regardless of load distribution.

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ADDRESS_____

TOWN_____ STATE_____

T6-60-2

excess of 7, since nominal capacity and weight of buckets total only 800 pounds.

This type of aerial lift provides working heights from 42 feet to 55 feet, depending upon the model, and rotates 360° continuously in either direction. The upper arm travels through 270°, and the lower arm 80° with a 120° lower arm travel available.

One of the features that appeals most to users is the small amount of hose and tubing required. The hydraulic lines extend only to the cylinders, thus eliminating 125 to 240 feet of hose and tubing and doing away with the possibility of oil leakage and the need for bleeding the lines. No hydraulic lines pass through the hinged joint between upper and lower arms.

Lifting workmen aloft is only one of the uses of the articulated arm aerial lift in *Figure Three*. Equipped with an optional winch, it becomes a versatile derrick. It can be used for setting poles or lifting heavy loads and can be operated from either side of the body or from the rear.

Because of the 360° continuous rotation of the mast, the lift used as a derrick can be located in any number of positions without moving the truck, saving time and money in construction and maintenance work requiring derrick operation.

The winch will lift 4,000 pounds and set poles up to 65 feet in length. Mounted on the mast, the winch is hydraulically driven from the hydraulic system with power obtained from the power take-off or from a separate gasoline engine.

Hydraulic Aerial Lift With Telescopic Boom

THE HYDRAULIC aerial lift illustrated in *Figure Four* is specifically designed for use by telephone companies. It has a reach height of 35 feet and simple pushbutton dimensional controls in the basket for use by the operator. The basket is supported by means of two fiberglass arms insulated from the rest of the unit.

The hydraulic pump on the unit has a capacity of six gallons per minute and provides pressure of 2,000 p.s.i. maximum. It is operated by a power take-off from the truck transmission. A five-gallon oil reservoir with built-in filter is provided for the pump supply. The aerial boom is raised and lowered by a hydraulic ram with 5-inch cylinder and 24-inch stroke. A six-gallon per minute hydraulic motor with gear reduction rotates the boom 360° in either direction. The boom is extended and retracted by a 3-inch diameter cylinder hydraulic ram of double-acting type with 120 inch stroke.

A bank of three hydraulic valves with a capacity of 15 gallons per minute at 2,000 p.s.i. controls the movements of the basket and boom. These valves are also controlled by three double-acting high capacity 12-volt solenoid override units, which provide pushbutton control by the operator in the basket.

The basket and telescoping support fold up when retracted to within the length of the truck and a mounting height of 18 inches over the cab of the truck.

As indicated in *Figure Four*, hydraulic jack legs are provided when specified by the customer. In place of the jack legs shown, a heavy counterbalance weight may be used to enable one man to ride in the basket at its fullest extension while the truck is being moved from location to location.

This type of hydraulic aerial lift is said to have the following advantages:

(1) It is claimed to be less costly than other types of aerial lifts.

(2) It can be used on any open type service or utility truck body and may be mounted on a 1½ ton or lighter truck.

(3) It can carry one man in the basket at full extension while the truck is moving. The man has full control of the movements of the basket when a control balance is provided.

Turret Derrick

THE TURRET derrick is another newly developed telescopic type aerial lift equipped with derrick head, digger unit, and fiberglass work basket, as illustrated in *Figure Five*.

The boom of the lift is made of rectangular shaped steel box sections which telescope one inside the other. The main boom is supported by a powerful double-acting hydraulic cylinder and by a rugged chrome-plated shaft extending from the cylinder. The main boom extends a substantial distance behind its hinged supports to allow for the extra telescoping of the other boom sections.

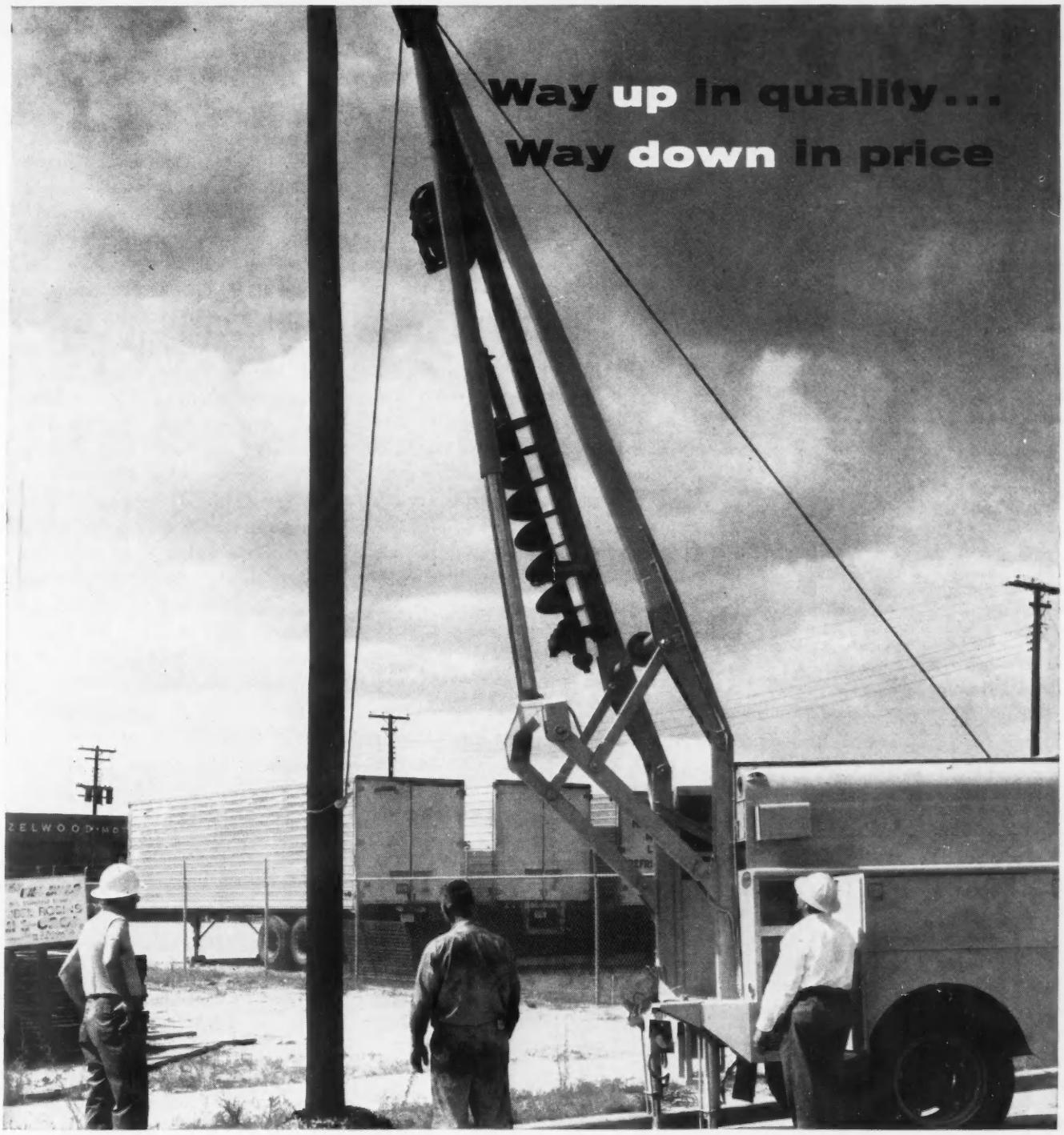
The main boom is mounted on a turret which is in turn installed on a fixed base. The base is mounted directly behind the cab and is fabricated of heavy duty steel parts. The hydraulic components, the controls, drives and gear boxes are compactly grouped within the base assembly, together with a hydraulic driven winch. The winch is so located that its extended shaft can be used for wire take up reels or capstans.

The turret has a full 360 degree rotation. A low speed, high torque hydraulic motor drives an enclosed lubricated worm gear reduction through a chain and sprocket. The worm gear rotates the main turret by means of a powerful triple chain and sprocket. A mechanical stop prevents continuous rotation.

The winch line passes through the hollow center of the turret to the boom over a sheave and up to a heavy-duty head sheave, which is attached to the upper end of the telescoping boom section.

An ingenious mechanism, the "retractomatic hinge" or folding link, enables the boom to be collapsed within reasonable dimensions for storage. Its action shortens the extended length of the boom, while at the same time lowering the over-all height to enable safe transportation on the road and easy storage in garages. The complete unit folds up within a 16-inch space over the truck cab and within the length of the truck. A steel hook automatically locks the retractomatic hinge in place when the derrick reaches an angle of 30 degrees or more.

The turret derrick can be equipped with a fiberglass insulated basket 48″ x 18″ x 42″ deep, large



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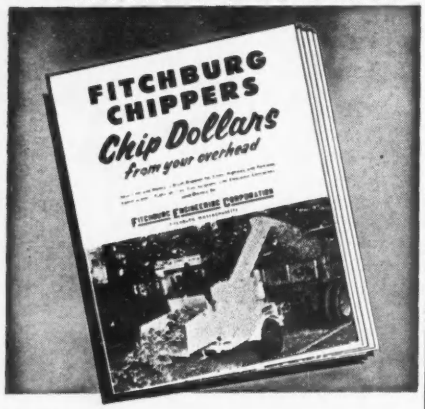

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enough to allow two men to work comfortably and safely side by side. The basket is supported by two arms which are fabricated of heavy-duty reinforced fiberglass with a 1″ core plywood center. The basket assembly is composed of high strength, resin impregnated cloth. The basket-and-arm assembly is counterbalanced by two springs so that the basket easily pulls into storage position when the locking pin is released. Thus the basket does not interfere with digging or derrick operations.

Friction brakes on the basket side arms hold the basket firmly, prevent swaying, and lock the basket in the operator's desired operating position. The brake is powerful enough to lock a man in position at any degree of elevation and yet is flexible enough so that, even when it is locked, a man cannot be tipped out of the basket inadvertently. Both basket and arms have been tested to withstand 50,000 volts dry flashover.

Two heavy hydraulic systems furnish the power for the derrick. One is used to power the extension, retraction, raising and lowering of the boom. The second system furnishes power for operating the digger attachment and for the winch used to hoist and lower derrick loads.

Dual type directional controls permit the operator to control his movements in a safe and dependable manner. One set of controls is mounted just behind the truck cab for unstowing the basket and for digging operations and the other set at the basket for the aerial work crew.

Manual controls are mounted on the right side of the derrick, the off-traffic side of the vehicle. The basket directional control system consists of three insulated plastic tubes, each with its own lever. The operator in the basket moves these handles directionally, producing a corresponding twist in the plastic tubes. These tubes have direct mechanical linkage to the valve assembly at the base of the boom.

Any lever movement the operator makes at the basket is duplicated at the valve assembly, giving the operator positive mechanical control over the derrick and the basket. This "feathering action" of the valves allows the operator to control minute movements of the derrick from a bare creep to full normal speed.

The digger attachment operates from a 2,000 p.s.i. hydraulic system with gear ratios available to produce the desired speed of rotation and torque. The derrick can provide as much as 8,000 lbs. down pressure to the auger head for difficult digging.

A novel feature is the manner in which the hydraulic digger is attached to the derrick boom. When stored, the auger head is attached to the side of the boom by a trolley which rolls along an aluminum I-beam track. In this position it does not interfere with derrick or aerial lift functions, yet may be unstowed and restowed automatically when needed. In this unique system, a 5/16″ wire rope attached to the trolley coils around each flight of the auger, lifting the auger to the carrying position as the operator turns the digger at slow speed.

Hydraulic outriggers provide a form base for the vehicle while the derrick is in action. They are actuated by double acting cylinders and are of the over center, self-locking type.

Oscillating Hydraulic Derrick

A NEW IDEA in hydraulic type derricks (shown in *Figures Six* and *Seven*) which has been developed enables construction work to be accomplished in limited spaces such as alleys and in narrow streets. This is a single-leg oscillating type derrick which is normally mounted on the curb side of the body with a hydraulic outrigger to stabilize the derrick and truck when the derrick is used to lift a heavy load.

The new derrick overcomes the limitations of ordinary derricks which have only a single operating arc (up or down). The oscillating derrick has a horizontal as well as a vertical movement enabling it to be used at the sides and rear of the truck, saving time and increasing the crew efficiency on the job.

The new derrick is said to elimin-

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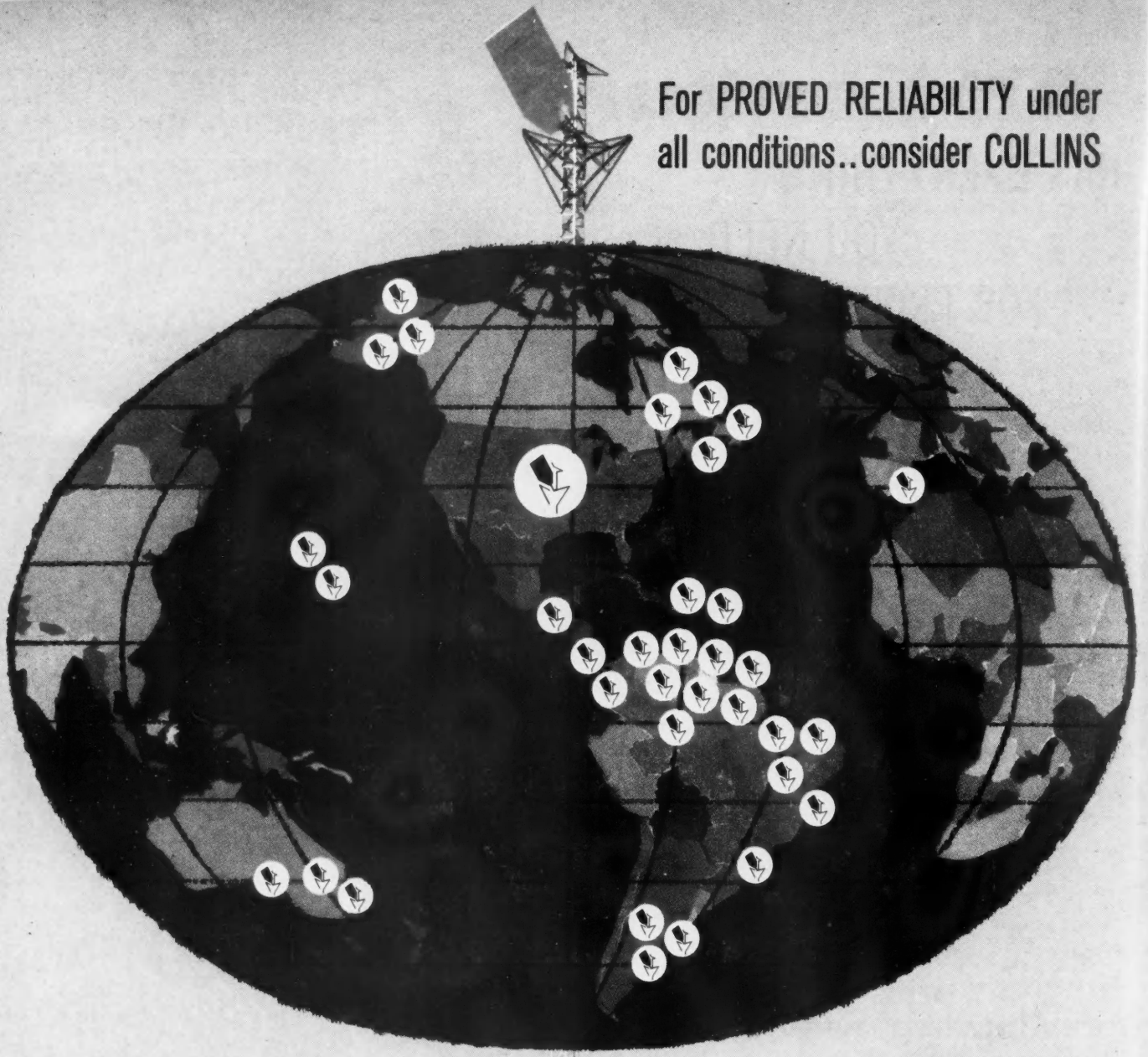

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ate the need for pre-spotting the truck to properly position the derrick for setting poles. The swinging range of the derriick makes it unnecessary to back the truck to the exact point for using the derrick each time a pole is to be set in a lead. The movement of the derrick and the outrigger is controlled by a single four-section valve, having separate levers for erection, rotation and extension of the derrick and operation of the outrigger.

A heavy-duty, double-acting hydraulic cylinder moves the derrick vertically to enable location of the head sheave at any point in an arc from the stowed position to slightly above the ground. Rotation of the derrick is accomplished by a double-acting hydraulic cylinder anchored to the body. The horizontal movement extends 180° from a position at right angle to the sides of the body. In this movement, the derrick can be at any angle of elevation. Double-acting hydraulic cylinders extend and retract the head sheave and raise and lower the outrigger.

The derrick illustrated has a hydraulic digger unit for boring the hole for setting the pole. The digger unit digs holes up to 10 feet in depth and up to 20 inches in diameter. The derrick provides the down pressure needed. This, coupled with the proper type of auger for the soil condition, enables the digger to operate in practically any kind of soil.

The digger unit does not interfere with the use of the derrick. It swings out of the way for pole setting work and locks in a support bracket on the derrick leg when not in use.

The control panel for the derrick, outrigger and digger unit is normally installed at the left rear side of the body shown in the illustration, though this may be installed elsewhere in the truck as required by the user. The control handles are spring loaded and return to neutral upon release, automatically sealing the hydraulic fluid in the cylinder. The derrick thus will not creep or kick back under load. If a hydraulic line break occurs, a counterbalance valve with manual release relocks the oil in the

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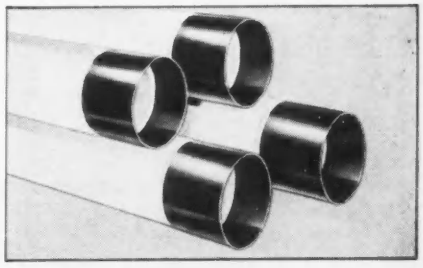

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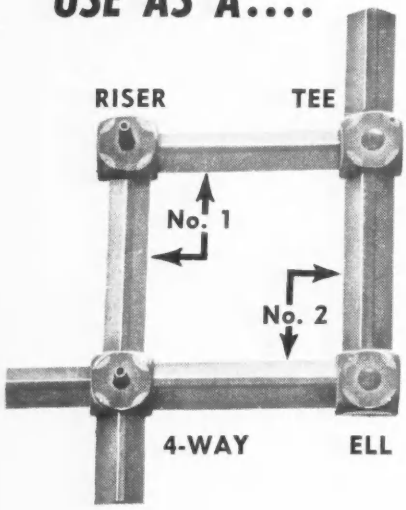

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cylinder and prevents movement of the derrick.

Aside from the ability of the derrick equipment to operate in limited areas, the truck can be parked parallel to the curb with minimum interference to the street traffic. The derrick can also be used to load and unload heavy materials inside the truck as for example a reel of cable used on the job. It is also used to load poles on a trailer hitched to the truck or unload the poles as required without having to maneuver the truck into the proper position and to disconnect the trailer for these operations.

Hydraulic Derrick With Extensible Boom Head

THE HYDRAULIC derrick illustrated in *Figure Eight* is available with or without an extensible boom head. With the boom head, the derrick can "stretch" an extra five feet to a height that enables it to lift longer poles. In spite of the greater height when extended, little lifting capacity is lost. Even without the optional extensible boom head, this derrick is said to have definite advantages that save man-hours and increase operating safety.

Two sets of cylinders provide greater leverage and make it possible to lift heavy loads in low ranges. Auxiliary cylinders raise the derrick to an almost vertical position, after which the main operating cylinders take over. It body-loads 4,000 pounds, will lift 2,000 pounds when only 5½ feet from the ground, and the capacity is 8,000 pounds. The derrick is so powerful that the downward force can lift the truck off its rear wheels. The ability to swing over close to the ground permits the use of power feed attachments for forcing diggers into hard ground. It also makes for easy threading of the winch line.

The digger (shown attached to the derrick) handles augers up to 30 inches in diameter, and provides 8,400 ft.-lbs. torque. In addition to the high torque speed for big augers and tough digging, a faster speed is available for normal digging and augers 16 inches or less in diameter. A third speed is provided for spinning dirt and mud off the auger blades.

A positioning cylinder assures straight holes, aligns the auger for digging anchor holes and provides more clearance while setting poles. The swivel-mounted digger swings any way the operator desires. One man controls the unit from the rear of the truck.

Line Construction Truck With Derrick and Digger

THE LINE construction truck illustrated in *Figure Nine* is a complete line construction unit which includes equipment and carrying facilities to perform the operations necessary for line construction.

The body unit is designed to perform line construction work faster and more economically with only a two man crew. It is available with the latest type hydraulic derrick and digger, either for front or rear operation, a selection of winch capacities with hydraulic winch operation, and other items of optional equipment which can be combined to do a particular job.

The hydraulic derrick used with the truck is designed for either front or rear operation. The derrick itself is constructed of rectangular steel tubing for stability and welded into a complete integral frame. An expanding center leg is used to provide maximum live boom action with safety under heavy loads.

This type of construction assures efficient operation under all conditions including heavy side loads and limits the lifting capacity of the derrick only by the stability of the chassis itself. As an example, when the rear derrick mounting is used, the operator need not worry about damaging the derrick because as long as the front wheels of the truck remain on the ground, the load can be lifted. For front operation with the derrick, the frame, axle, and springs of the truck provide the lifting limitations.

Poles up to 45 feet can be set and a ground prop with foot plate is

employed as a part of the standard equipment.

The operation of the hydraulic derrick is positive and simple. Two levers control all operations and lever location is such that the job to be done is always in full view and under full control of the operator.

The hydraulic digger is designed to function with the hydraulic derrick. Stored with the derrick, it is ready to go into action at a moment's notice.

The auger and hydraulic motor of the digger is contained and guided within a rectangular tubular frame, and when the feet of this frame are firmly planted on the ground, a down pressure is exerted on the derrick. After the feet have been firmly set, the digger will dig a hole in either a vertical or angular position, at the exact location required, without further manual guidance.

Down pressures of approximately 4,000 pounds can be exerted when the auger is required to dig in frost and hardpan soils, and holes up to 22 inches in diameter, eight feet deep, can be readily accomplished.

The digger acts as a ground prop as well when required.

Digger operation is simple and safe with actuating controls located and co-ordinated with the derrick controls.

The digger is designed to make easy work out of difficult jobs. Operations such as digging on a bank above the truck, or in a ditch well below the truck, can be accomplished without special adapters or the rearranging of equipment. Digging holes close to a wall on the opposite side of a fence, or against a pole to be replaced, is easily performed as well.

Light-Weight Derrick And Digger Unit

TWO-TON and heavier construction trucks are in common use for telephone construction work. Vehicles of this size are used in most telephone construction projects. For the small telephone companies, a heavy truck is a large investment that cannot be afforded.

It is, however, possible to employ ¾-ton or 1-ton trucks for light construction work using the light-weight derrick and digger as illustrated in *Figure* 10. The equipment shown is capable of setting poles up to 35 feet long and will dig holes up to 7 feet in depth. It includes a derrick with two heavy-duty tubular steel booms, which mount on rugged four-inch channel frame, a digger unit which travels up or down torque bars, and a hydraulic pump, driven by a truck power take-off with a control mounted on the dash. Power is transmitted to the hydraulic motor, which drives a three-ton clutch-equipped winch.

The hydraulically operated boom folds back over the cab when in the travel position, resting in a frame cradle. The hydraulic power winch is controlled by a four-way valve which provides forward, reverse and braking of the winch. From a position outside the truck, the operator can raise, lower, and brake the winch to control the raising and lowering of the digger unit. Controls for the auger provide instant forward and reversing of the auger operation. The cable hoses and controls are arranged to leave the bed of the truck available for other equipment.

With the location of the controls close to the rear of the truck, one man can control the entire operation of digging the pole hole and setting the pole by himself.

To Be Continued

Relay Manual

DIAPHLEX Division, Cook Electric Company, has announced the release of a new Relay Manual featuring 30 types of relays (with 1,000 variations) for communications, computers, industry and the military.

Using photographs, line drawings, tables and descriptive material, the publication presents detailed data on the many established pile-up relay types, variations in spring arrangement, timing, coil voltage, contact ratings and other useful classifications.

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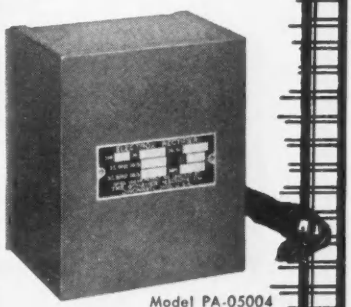

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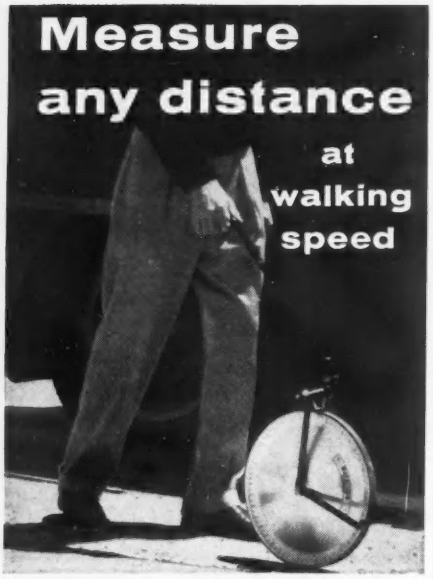

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"ONE-PARTY SERVICE"

(Continued from page 50)

to reach by 1967. *In two years the company had exceeded the one-party growth it had expected in* 10 *years.*

Looking at *Chart One* you will observe several interesting things. The one-party service increased from 39 stations to 116 stations, an increase of three times inside of four years. This was a one-party growth from 12.4 percent of total residence stations to 26.9 percent.

Two-party service stayed fairly level at between 3 percent and 5 percent of total residence stations. Four-party service declined from 57.5 percent of total residence stations to 42.0 percent but remained stable in quantity, being 181 in 1955 and 181 at the end of 1959. Ten-party services likewise stayed fairly static in the range of 25.6 percent to 27.0 percent of total residence services.

In this small exchange of less than 500 residence stations, it is obvious that demand for party-line service is stable and the demand for one-party service is increasing sharply. When asked for an explanation, the owner-manager said that mobility of population was bringing in people from metropolitan areas who had been accustomed to one-party service and who were now demanding it from him.

Now, study a medium size exchange with between 7,000 and 9,000

CHART ONE
COMPARATIVE RESIDENTIAL PRIMARY SERVICES
FOUR YEARS — SMALL EXCHANGE

	At Year End			
Grade of Service	1959	1958	1957	1956
One-Party				
Quantity	116	98	51	39
Per Cent	26.9%	25.6%	14.5%	12.4%
Two-Party				
Quantity	23	15	16	10
Per Cent	5.3%	3.9%	4.5%	3.2%
Four-Party				
Quantity	181	172	190	181
Per Cent	42.0%	44.9%	54.0%	57.5%
Ten-Party				
Quantity	111	98	95	85
Per Cent	25.8%	25.6%	27.0%	26.9%
Total Primary Residence Services				
Quantity	431	383	352	315
Per Cent	100.0%	100.0%	100.0%	100.0%

CHART TWO
COMPARATIVE RESIDENTIAL PRIMARY SERVICES
FOUR YEARS—MEDIUM EXCHANGE

	At Year End			
Grade of Service	1959	1958	1957	1956
One-Party				
Quantity	3098	2298	1460	932
Per Cent	34.6%	27.1%	18.0%	12.5%
Two-Party				
Quantity	3796	3844	3853	3661
Per Cent	42.4%	45.3%	47.6%	49.1%
Four-Party				
Quantity	2023	2293	2742	2809
Per Cent	22.5%	27.0%	33.8%	37.7%
Ten-Party				
Quantity	46	50	46	50
Per Cent	.5%	.6%	.6%	.7%
Total Primary Residence Services				
Quantity	8963	8485	8101	7452
Per Cent	100.0%	100.0%	100.0%	100.0%

residence primary services. *Chart Two* indicates the residential development by years 1956 through 1959. Here again you will observe the sharp increase in one-party service, from 12.5 percent of total to 34.6 percent or an increase of almost three times. Numerically, the increase was from 932 to 3,098 — *in three years.*

Similar to the smaller exchange mentioned above, the two-party services remained fairly stable at 3661 in the year 1956 and ending the year 1959 with 3796. The four-party services declined from 2,809 to 2,023.

The one-party increase was 332 percent (932 to 3,098) without the benefit of promotional activity. How high the one-party demand would have gone if the company had done anything more than satisfy the customer-originated request for one-party service, there is no means of knowing.

We have seen that one-party service is growing in the small exchange and in the medium size exchange; what about the Bell System as a whole? *J. Robert Talbott*, writing in the autumn issue of the *Bell Telephone Magazine*, had the following to say:

"Rising income and a favorable price have produced significant potentials in which several items the System sells are going quite well; that is, they are growing faster than households and faster than our other services. They are residence one-party service, residence extensions, and long distance messages.

"The first of these, residence one-party service, is our best seller — next to main service — in terms of proportion of prospective customers already sold. Approximately one-half of the residence subscribers have it. *At the current rate of growth this would be* 100% *before* 1970, although this rate will almost certainly slow down then." (italics supplied)

We now have our third conclusion: *One-party service demand is growing faster than general telephone service demand which is growing faster than our exploding population, which in itself is growing tremendously!*

Mobility and Ability

THE POPULATION *mobility* results in people finding out how the other half lives. When they do this they demand one-party service in their new locations. Witness the experience of the owner-manager in

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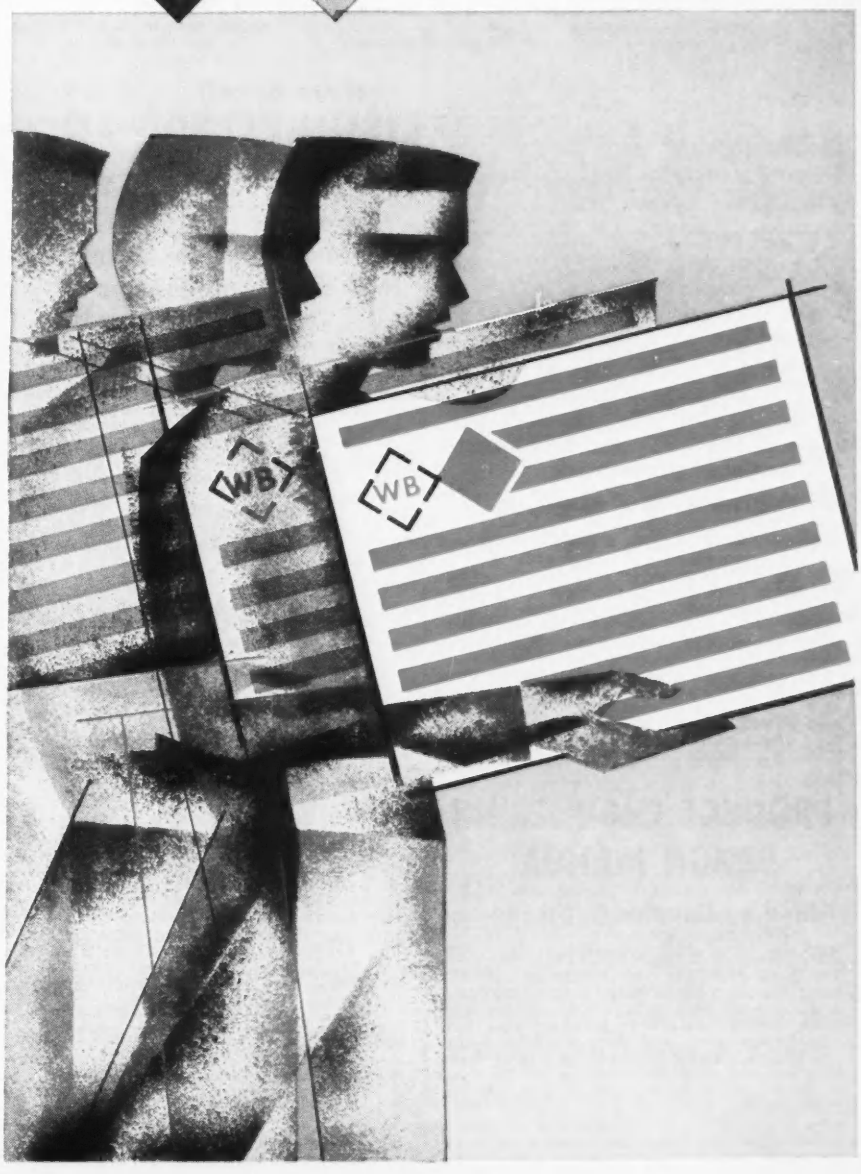

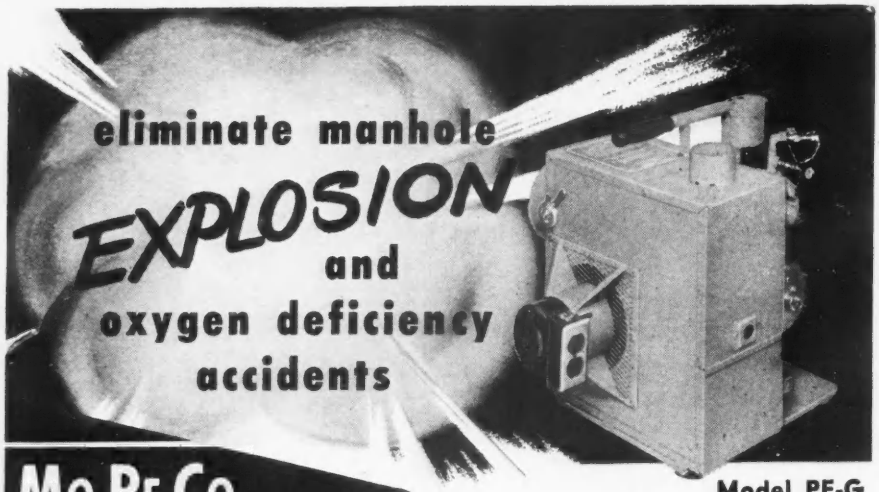

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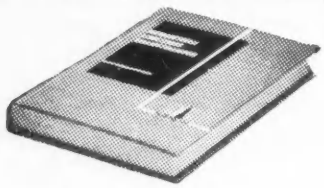

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PRODUCT ENGINEERING DESIGN MANUAL

Edited by Douglas C. Greenwood
Editor, Product Engineering Design Digest

342 pp., 8½ x 11, over 1100 illus., $9.

The book provides a storehouse of material to stimulate you to new design ingenuity, and to help you gain improved mechanisms, better assembly methods, and savings in materials and time. Over 100 topics are systematically arranged and illustrated. You can see how each device works, what it does, and how it meets design requirements. Thus, the book gives you the "feel" of a problem by showing in detail what is good, what has been done, and what is acceptable.

Gives up-to-date facts and data on resistors

Just Published! This book thoroughly covers fundamentals and needed data in the use of resistors in electronic design. You get groundwork in the basic aspects of resistance and descriptions of each type of resistor, the materials used in its manufacture, and characteristics associated with each type. Comprehensive tables give most manufacturers' data, with specific types of resistors covered in common tables. Thus, a design or components engineer can easily determine the scope of what is available. Full attention is given to such important areas as reliability in resistors, measurements, etc.

RESISTANCE AND RESISTORS

By Charles L. Wellard
Technical Director, Clifton Precision Products Co.

264 pp., 6 x 8, 82 illus., $8.50

Among the book's many special features you will find a detailed treatment of precision films as a replacement of wirewound resistors. Included, too, is information on the preparation of precision films by pyrolysis, evaporation, and reduction of oxides. Numerous charts and graphs present information that heretofore has seldom been readily available regarding the power and voltage ratings of resistors, the varieties of material used in their construction, and their many industrial applications.

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the small exchange mentioned in *Chart One.*

Customer *ability* to pay results in demand for the best. So much has been said of the greater availability of discretionary dollars (dollars to spend on things not the basic necessities of life) that we shall here make only two points.

First, the increase in personal income from 1958 to 1959 was 6.6 percent per capita across the nation and the projected increase for 1960 is 6.4 percent per capita, 13 percent more per capita income within two years.

Second, the after-tax results of the increasing per capita purchasing power give birth to more and more middle income families and fewer low income families. This shift from the low income to the middle income group means that more families will now be able to afford telephone service and those already in the middle income group will be able to afford more expensive telephone service.

In summary, the demand for one-party service is very real and right now sitting on our door step. This demand is going to be no respecter of telephone companies and will not accept as an answer the excuse that any particular telephone company is not now ready to provide one-party service in large quantities. Apparently, the customer wants it and the customer can afford to pay for it. But — can we telephone companies afford to provide it?

Proving It In

FOR YEARS some of our telephone people have believed that the provision of party line service is more profitable to the telephone company than making one-party service available. This I do not believe. In my opinion, and this is only one man's opinion, it is a wiser investment policy for a telephone company to provide one-party residential service *within its base rate areas* than to provide party-line service. These are my reasons for so believing:

(1) *Residence one-party service brings about significant improvement in public relations because of the*

service advantages related to the main line.

(2) *The economic advantages of party line service over main line service have been seriously overstated.*

It is possible to write an entire article on the two points mentioned above. However, briefly stated, the public relations are improved because the customer no longer finds someone else on his line, trouble clearing time is less on one-party lines, code ringing or ring over conditions do not bother one-party lines and certain telephone services which are available to one-party lines cannot be made available to multi-party lines.

The economic advantages of party line service have been overstated when we say that four lines are required for four main line stations whereas the same four stations could be served from one four-party line. Using this measurement device is a fallacy because it overlooks so many significant factors which must be considered when comparing the economic results of one-party vs. four-party service. Just a few of these are:

(1) *Main line telephone instruments are usually cheaper than party line telephones.*

(2) *Main line telephones will generate more toll revenue than party line telephones.*

(3) *Main line telephone subscribers will install more extension stations than party line subscribers.*

(4) *The average four-party line saturation is far below four stations. A good objective four-party line fill is 80 percent, but many is the time that I have seen an average fill of less than two parties per four-party line, even* 1.25.

(5) *Line circuitry required in the central office equipment does not increase four times when changing four four-party subscribers to four main line subscribers. In fact, it has been estimated that typical central office investment will go up only* 15% *if four-party stations were upgraded to one-party.*

(6) *Significant reductions in expenses are made when transferring from four-party service to one-party. For example, trouble clearing time is shortened, testing costs are reduced, traffic department number change expense is reduced, line transfer expense for grouping parties is reduced, commercial department expense in party line complaints is reduced, plus many other considerations.*

Available Equipment And Ideas

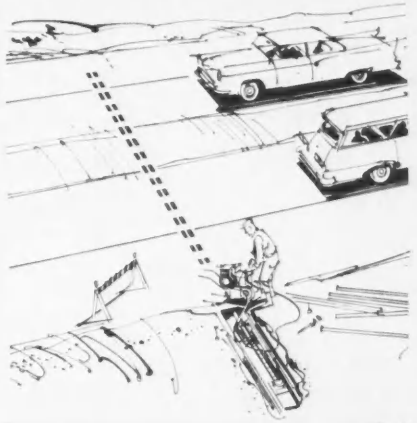
TELEPHONE industry manufacturers and suppliers are every year bringing forth new ideas and equipment for less expensive provision of one-party service. *Bill Corman*, writing in the August 15, 1959 issue of *Telephone Engineer and Management*, mentioned several of these as partial solutions to one-party service in rural areas.

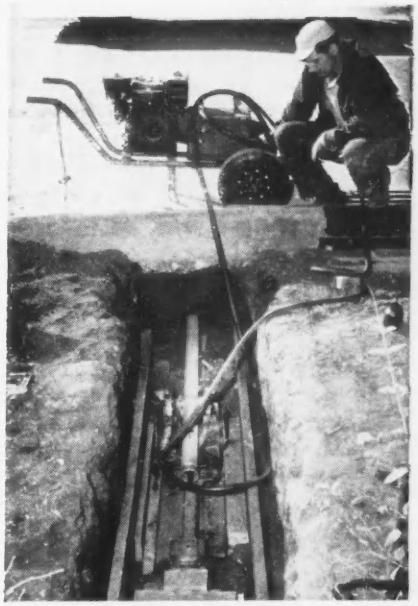
He discussed subscriber carrier, large size cables being cheaper than open wire or small size cables, line concentrators, new construction methods such as buried cable. Further, he mentioned in the November 15 *Telephone Engineer and Management* a new and different central office equipment arrangement for providing more one-party service in rural areas. He pointed out that with certain rearrangements of central office equipment, at about the same cost as the present standardized methods, it might be possible to cut in half the outside plant distribution costs.

In summary, let me say that the demand for one-party service is mushrooming across the country in both metropolitan and rural areas. *Fertility*, *Mobility* and *Ability* are the underlying causes. The population is growing. It has seen and now desires the best — which is one-party service.

Not all telephone companies will be affected immediately but ultimately we shall all have to face this question. Apparently, we do not have a choice of whether to provide one-party service; we have before us only the challenge of how we are going to do it. Presumably, it would be wiser on our part to follow a plan of progressively growing into a heavy proportion of one-party service than having to do it all at once. I think I'll start planning now. How about you? — *Allan R. Stacey.*

EASY, LOW-COST WAY TO RUN PIPE UNDER STREETS AND WALKS





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MAINTENANCE

(Continued from page 52)

full foliage, is probably the most satisfactory. At this time, it is easier to tell where roadside growths have been killed by chemical treatment the previous season and to determine the extent of any mechanical tree trimming required to remove the tree branches growing too close to open wire lines and drops.

Annual Inspection Program For Rural Areas

FOR BEST results, a qualified man must conduct the inspection. Usually he will be the manager of the company exchange or exchanges, since he has the experience and a personal interest in the successful outcome of the inspection.

Another man should accompany the manager to drive his car or truck and leave him free to make visual checks as they drive the country leads. As each unsatisfactory condition is found, the manager may jot it down on a pad of paper or use a report form such as the one illustrated on page 52. This form is used in conjunction with a rural plant record map of the exchange which shows the location of the open-wire lines, spurs, drops, stations, and junction with entrance cable to central office.

Entries on the inspection form illustrated are explained as follows:

Mile And Pole No.: — Mile number and pole number (counting in direction away from central office).

Wire Load: — Number and kind of wires in place.

Example: 6-I for six 109 steel line wires, 2-C for two 104 copper wires, 2-CW for two copperweld wires.

Pole: — Length, class, and timber species of present pole.

Under remarks, show new pole requirement. (Where tall poles have been placed to provide tree clearance and the trees subsequently were removed, these poles should not be replaced with shorter poles, unless they

Old-time plant worker on maintenance assignment after periodic inspection.

carry sidearms and are raked to such an extent as to constitute a hazard to the public and employes. In such instances, the poles will require replacing with shorter poles, 16 or 20 feet, as required, using standard construction.)

Crossarm And Bracket: — Number and type to be replaced.

Example: 1 — 6P for one 6-pin crossarm, 2 — 8′6″ for two 10-pin pony crossarms, 2 — 10′A for two 10-pin type A crossarms, 2 — 10′B for two 10-pin type B crossarms, 1 — DE for one dead-end crossarm, 2 — B for two wood pole brackets, 2 — DEB for two dead-end brackets.

Anchor: — Size to be replaced.

Example: 4″ for 4″ screw anchor, 5″ for 5″ expanding anchor, 8″ for 8″ expanding anchor, NC for plate anchor.

Guy: — Size of guy to be replaced.

Example: 2.2M for 2200-lb. guy, 6M for 6000-lb. guy.

Drop: — Check mark shows work to be done as explained under remarks.

Example: Pull slack in drop wire,

set drop pole, set taller pole, reroute to clear trees.

Insulator, Drop Clamp, Pin, Hand Connection, and Crossarm Bolt Lag: — A check mark in the proper column indicates replacement to be made or work to be done.

Tie Wire: — Kind of tie.

Example: I for 109 Iron, CU for copper, CW for Copperweld. Under remarks, show the type of splint required for copperweld tie wires.

Jumper: — Check mark indicates replacement. Under remarks, show size, kind, and length of wire.

Pull Slack: — Check mark indicates work to be done on this item. Under remarks, show the number of spans and kind of wire to be pulled.

Trim And Spray: — Check mark indicates work to be done.

Remarks: — Work required to correct unsatisfactory plant condition or item clarification.

This inspector checks for the following unsatisfactory conditions for listing on the inspection form:

Poles: Place (new pole); remove; replace (decayed or damaged); move; interset; straighten; rake; stub; foreign attachments, unauthorized; unused attachments; and improper joint-use construction.

Brackets: Place (new brackets); remove; replace (split or broken, or worn threads); renail.

Crossarms: Place (new arm); remove; replace (decayed or damaged, or bad pins); replace missing nut and washer, crossarm bolt; replace missing nuts and washers, brace bolts; and retighten loose nuts.

Anchor: Place; remove; replace (inadequate for load); or relocate.

Side arm: Place; remove; or replace.

Guy, Down: Place; remove; re-

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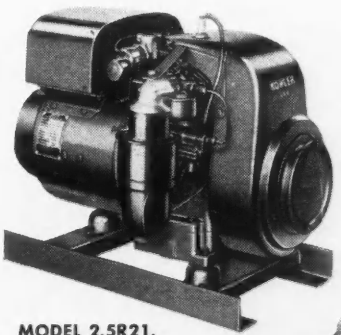
Use portable, direct service Kohler electric plants on maintenance and repair trucks—compact, quick-starting, high capacity for power tools and floodlights... Sizes to 100 KW, gasoline and diesel. Write for folder J-12.



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place (inadequate, defective, or damaged); pull slack; guy guard.

Guy, Overhead: Place; remove; replace; pull slack.

Line Insulators: Place; remove; replace (broken or floating); retighten (on pin or bracket); straighten transposition brackets.

Line Wires: Place; remove; replace (corroded or damaged); adjust sag (too tight); pull slack; retie; cut out bad splice; remove debris; clearance from ground; clearance from power or other foreign wires.

Rural Distribution Wire: Place; remove; replace (damaged conductors); adjust sag; clearances from ground or from power wires; remove debris.

Drop Wires: Remove; replace; transfer; reroute; raise (for more clearance); repair; reconnect (with standard sleeves).

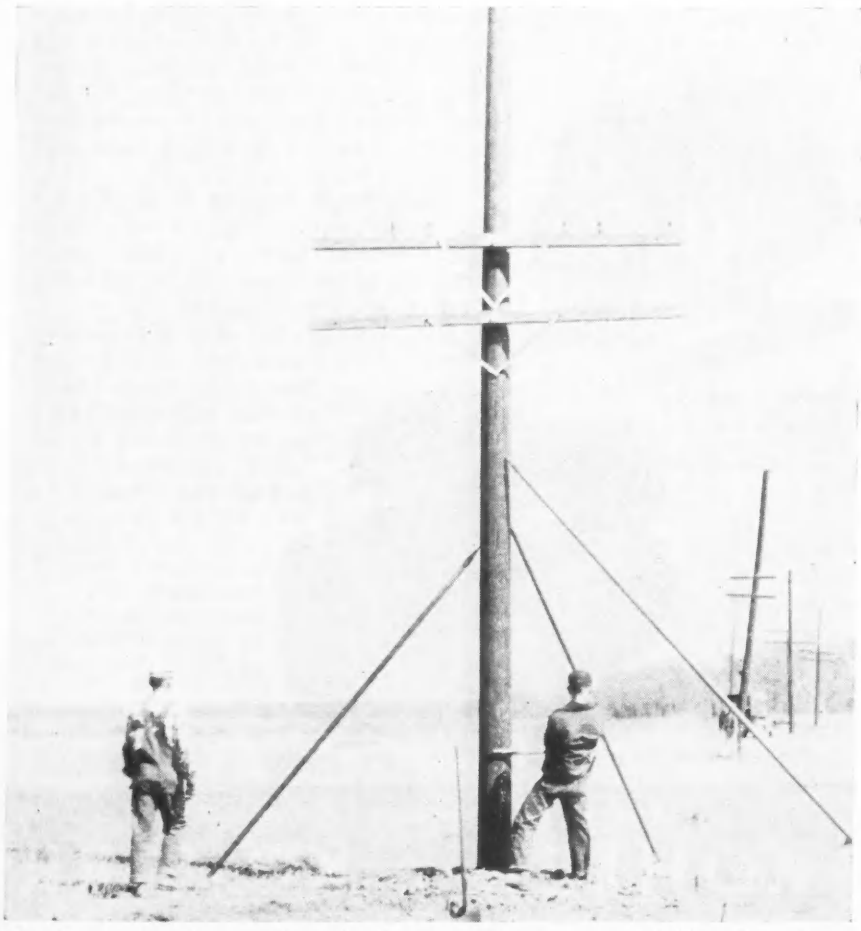
You are invited . . . to tell TE&M authors your problems of department policy or procedure on which you'd like to have an opinion.

While we don't claim to have all the answers, we'll welcome the opportunity to discuss as many as possible in our columns . . . and that could be helpful to you and others with the same (or equal) problem.

Trees: Trim for line wires; trim for drop; cut down; cut underbrush; spray.

Jumpers (Buckarm Corners): Place; remove; replace (damaged); reconnect (with standard sleeve); tape bare splices (insulated wire).

For town plant, a separate inspection form is employed with entries to indicate any unsatisfactory condition of cable, drops, and poles, also open wire or rural distribution wire runs inside town boundaries. A base plat of the town which shows the pole location is employed with the form.



Outside construction crew handling heavy maintenance work. This pole replaces one that was removed and is being aligned.

The poles are located by numbers shown on the plat. The following cable maintenance items are entered on the inspection form.

Bowing of cable.
Supports (missing or loose.)
Terminal defective.
Tree clearance.
Climbing space needed.
Low drop.
Pole rotted or damaged.
Riser pipe damaged.
Pole stepping not standard.
Detachable step needed.
Loose or missing pole steps.
Grade clamp needed.
Lateral damaged.
Insufficient clearance from power or light wires in span.
Insufficient clearance from power or light wires or fixtures on poles.
Improper terminal feed.
Drop runs passing terminals.

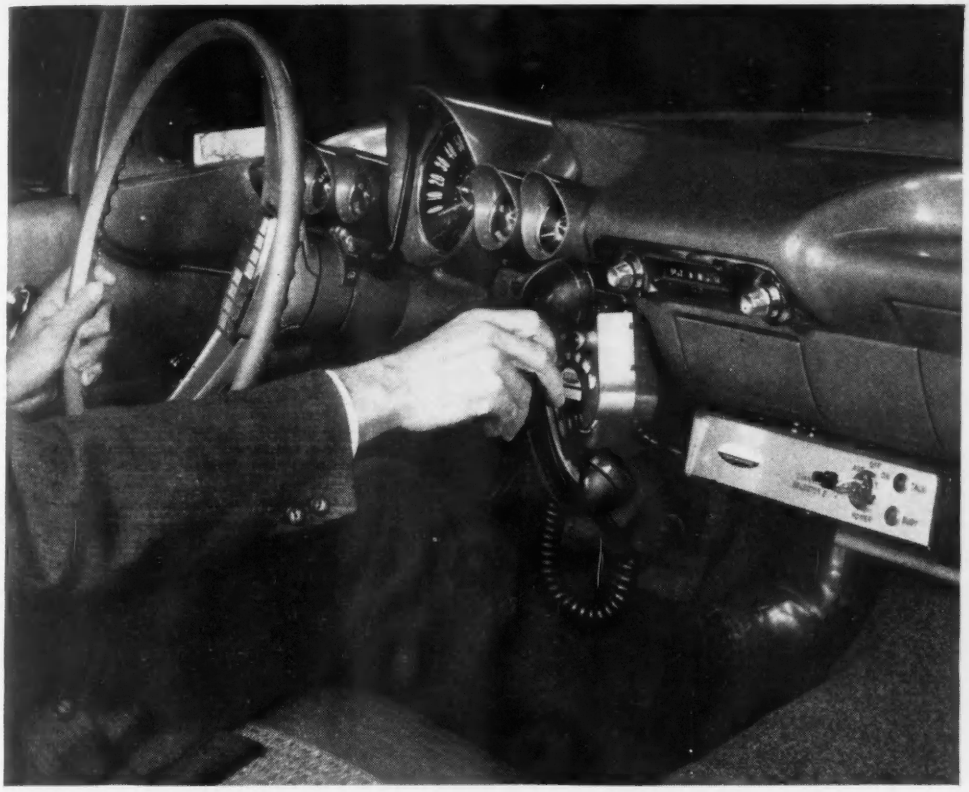
Open wire feeds and drops in town are inspected in the same manner as rural plant. Their locations are shown on the town plat by numbers which are entered on the inspection form.

To expedite the maintenance work without interfering with other exchange jobs the manager may employ a plan similar to the one described below:

Prepare copies of work tickets, each one listing a maintenance item from the inspection form. On copies of the rural plant record map and town plat, show the maintenance items in abbreviated form, at their locations, as for example, "P1 2DEB" "Adj. wire sag," "P1 guy guard." These work tickets are given to the plant workers from time to time as they are assigned regular installation or trouble work. The manager will keep duplicate copies as a check on the progress of the maintenance work.

As each man is assigned the tickets, the maps are checked for the maintenance work along the route the man is to travel on his regular job assignments, and the memorandum forms are selected to cover the route. The worker stops at each location indicated on the forms and makes necessary repairs and replacements and shows the work completed on his copies of the forms. On his return, he gives his supervisor all the forms that were assigned to him, including the ones that he did not have time to work on.

The manager then lines out the



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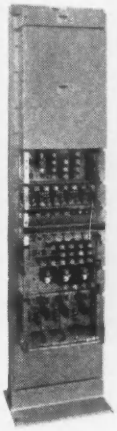

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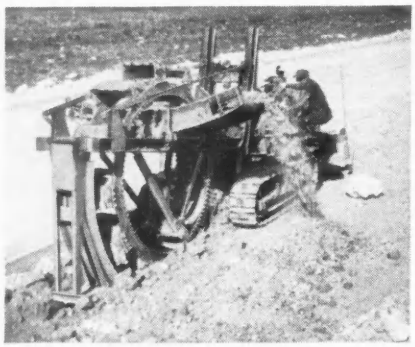

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completed jobs on the maps and checks the completed forms against his own copies. This procedure gives the manager complete control of the work operations involved in the preventive maintenance program. If the work must be done by an outside crew, the crew foreman is given a copy of the inspection form and the manager then uses his own copy to check on the work done by the crew.

Good maintenance requires good supervision, with a working force adequate to cope with all preventive maintenance work, trouble assignments and installation orders, as well as time to sell telephone equipment on the job. In the smaller companies, the manager often has to perform this necessary supervision and may have to do some of the work, too. If he has the judgment and experience and can impart his enthusiasm for the maintenance work to his men, the company will be assured of good telephone service to its customers. — *Richard Allen.*

Computer Language

NEW 16-page application information manual on the Model ZA-100 Computer Language Translator describes its data translation capabilities, the basic translation system, common translation modes, and other basic information.

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The Model ZA-100 provides for rapid and efficient translation of data between different types of automatic data processing systems or computers. Magnetic tape recorded in the format of one computer can be translated directly to magnetic tape usable by a different computer.

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TRUCK MAINTENANCE

(Continued from page 54)

at 20 miles an hour, second gear used 15 to 30 per cent more gasoline than high, and first gear used 30 to 50 per cent more.

(3) Driving speeds: A speeding driver loses gasoline mileage. A car capable of 20 miles per gallon at 20 miles an hour can deliver 19.7 at 30 miles an hour, 15.9 at 50 miles an hour, 12.2 at 60 miles an hour, and 8 miles at 70 miles an hour. A car gets better mileage in country driving not because of the speed but because there is not so much stopping and starting.

(4) Jack-rabbit driving: Overworking the gas pedal practically pumps gasoline right out of the exhaust and can result in consuming as much as 30 per cent more fuel.

(5) Proper engine warming: Correct engine warming procedure is a big gasoline and engine saver. A warm engine uses less gasoline, but it is important not to overdo the use of the choke and not to pump the accelerator, racing the engine. The engine should be allowed to warm up at moderate speeds. This also helps warm the oil and reduces engine corrosion.

(6) Needless idling: Idling the engine when parked uses up from 5 to 10 per cent more gasoline.

(7) Excessive clutch usage: On a test route through a hilly area a car was held uphill at stops by slipping the clutch. This is not only hard on the clutch but the mileage came only to 10.3 miles per gallon. When the brakes were used to hold on the hills, the car averaged 13.7 miles per gallon.

The development of good driving practices in these men produced additional dividends in fewer repairs and longer vehicle life because of the reduced strain on the vehicles.

Safety Maintenance Checks

THE SAFE and economical operation of motor vehicles additionally depends on correct maintenance procedures. The larger companies, of course, have garage personnel to handle this important and quite diversified work. In these companies, the motor vehicle inspector is the one who makes the safety maintenance checks so necessary to the efficient operation of the various types of motor vehicle equipment.

As in the familiar poem, "doctor, lawyer, Indian chief," during the course of a day's activity the motor vehicle inspector is called on to be a diagnostician, electrician, chemist, bookkeeper, and somewhat of a horse-trader. Basically, he must be a master mechanic with an extensive knowledge of the automotive industry. He must have a thorough knowledge of his company and the vehicle uses and needs of each department in the organization.

He needs to know the peculiarities of each vehicle and when it is likely to need a check.

His main job is to detect motor vehicle trouble in its incipient stages before it can disable the vehicle or endanger the driver. To accomplish this objective, the inspector schedules his vehicles for periodic maintenance inspections, depending on their use; installer trucks every four months, automobiles every three months, construction trucks every month. First on a car lift and then by driving, he diagnoses the vehicle's condition and determines what, if any, corrective measures are needed.

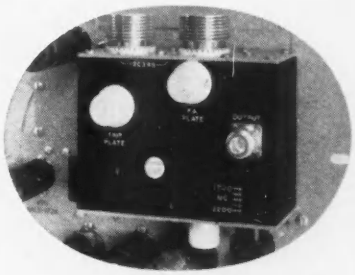
Minor adjustments, like tightening a fan belt or replacing a light bulb, are taken care of on the spot. All other repair work, lubrication, and so on, is handled by a commercial garage under his supervision. Safety-affecting troubles are corrected immediately. Repair scheduling of other items discovered during inspection depends on the age and expected additional life of the vehicle, its availability for repair and the type of service it provides.

With the vehicle on the lift, the inspector examines the steering apparatus, gear train, brakes, body and chassis, fuel system, exhaust system,

B. E. C.

2 KMC

FOR THE TELEPHONE INDUSTRY



WRITE FOR COMPLETE DETAILS

TYPE 14CW

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CARRIER AND MICROWAVE

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Designed for :*Efficiency*
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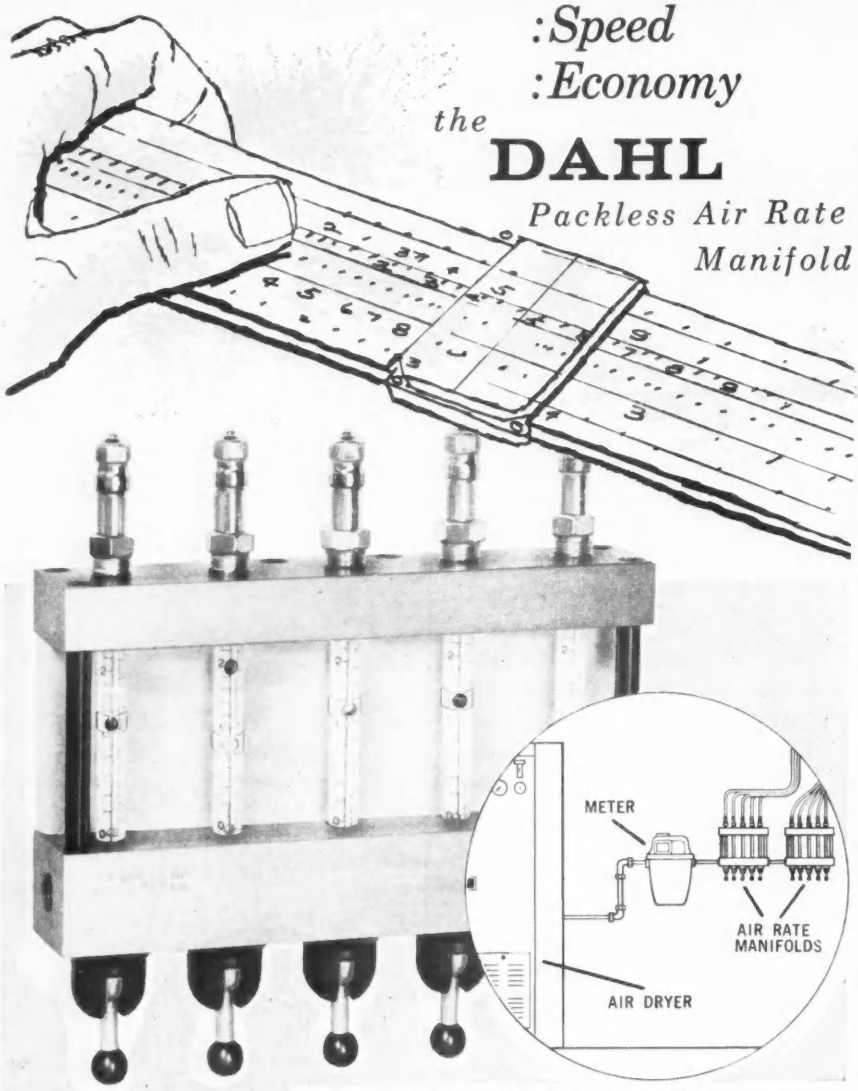
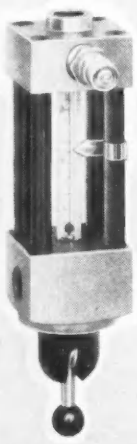
DAHL
Packless Air Rate Manifold



This unit is actually a group of 5 separate indicators ganged together into a single, compact unit which requires fewer connections than separate indicators would demand. Each indicator has its own toggle shut-off to provide a means of disconnecting the individual cable from the gas source without affecting the flow to other cables. A pressure testing valve is mounted in the upper block of each unit of the manifold to measure cable pressure or introduce an auxiliary supply of gas on a temporary basis.

The air rate manifold employs both a glass and a stainless steel indicator ball in each gauge. When gas flow exceeds the maximum rating of the lighter glass float (2½ SCFH), the stainless steel float rises giving accurate readings from 2½ to 7½ SCFH. Sliding reference pointers on each gauge give a fast visual check on day-to-day changes in flow rate for each system.

All connections are anodized 24 S-T aluminum.



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wheels and tires. At the same time, he checks auxiliary equipment such as winches, derricks, diggers, augers, wire reels, pumps, and manhole ventilators.

The inspector usually takes the vehicle's driver with him on driving inspections, to obtain his thoughts on the condition of the vehicle and also to help him by giving him additional information on his truck.

On call 24-hours, the inspector often must make roadside repairs and inspections, his most frequent job involving construction trucks since so many things are apt to go wrong with them.

Companies having only a few vehicles cannot justify such elaborate setups for safety maintenance checks. However, maintenance checks can be easily made by contracting commercial service stations and garages to handle this important work. It is well to have forms for the regular check-ups to be made and thus assure that each vehicle is getting the proper upkeep.

To keep motor vehicle costs at the minimum, the vehicles must be properly selected for the work they are to perform, and the drivers must know how to operate them safely and economically. Last, but not least, the vehicles require proper maintenance at regular intervals and replacement at economic intervals. — *James Boyd.*

"Stunt Box" Brochure

TELETYPE Corporation offers a new 20-page, 4-color brochure entitled "Teletype 28 Stunt Box." Its primary purpose is to provide users and potential users of Teletype Model 28 equipment with an understanding of how Model 28 page printers and automatic send-receive sets can be utilized to maximum capabilities.

All technical explanations are color-keyed for easy comprehension. A page-selector key lists brochure organization, serves as a guide to every page.

Free copies are available upon request. Write to *Teletype Corporation, Dept. SP-9, 4100 Fullerton Avenue, Chicago 39, Illinois.*

Plant departments of telephone companies are saving several hours a week by making copies of detailed cable charts with electric copying machines, rather than by hand. When an engineer wants a copy of a cable chart he calls the plant assignment office, the chart is removed from a rotary file and a copy is made in seconds. — (Minnesota Mining and Manufacturing Co. photo.)

Electric Copying Machines Save Time And Reduce Costs For Plant Dept.

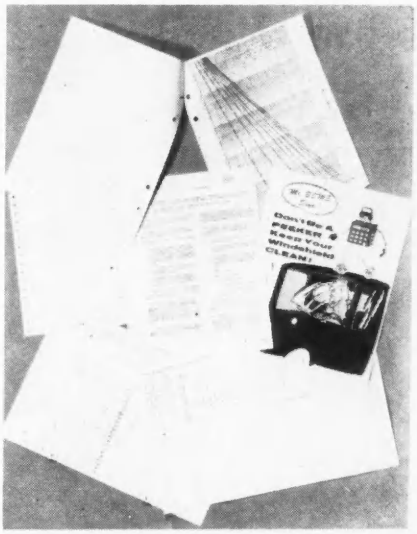
OBSOLETE paperwork methods and clerical waste can be as costly to telephone companies as damaging storms, cable breaks and power failures. That's the evidence turned up by a comprehensive survey of office methods and procedures recently completed by a leading business machine manufacturer.

While hundreds of telephone companies throughout the country have turned to modern business equipment, still others are sadly behind in coping with the bulging paperwork battle.

The survey — made by Minnesota Mining and Manufacturing Co. — revealed that the proper business equipment, in the right place at the right time, can save thousands of dollars in clerical effort and excess time.

Typical of today's hour-and-dollar saving office equipment are electric copying machines. These machines are being used in the accounting, commercial, directory, plant and traffic departments of telephone companies to make extra copies of letters, charts, reports, memos, and other written, printed or drawn items in just a few seconds.

Some of the greatest time savings are being recorded in plant departments where copying machines are used to make copies of cable charts for plant engineering studies, cable



Among the items that can be copied by an electric copying machine are key systems, cable charts, service orders, safety tips, field practice notices, and new ideas and products bulletins, shown above. Exact copies of these items are made in as little as four seconds. — (Minnesota Mining and Manufacturing Co. photo.)

transfer work, cable failures, special communications investigations, and central office main frame checks.

Formerly, for example, an engineer spent a half hour or more hand copying information from a chart. Now, a clerk in the plant assignment office places a cable chart and a piece of copying paper in the copying machine and presses a button. Seconds

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later an exact copy is produced — ready for immediate use.

In Phoenix, Ariz., the offices of the state plant manager, district plant superintendent and plant assignment department of the Mountain States Telephone & Telegraph Co. use "Thermo-Fax" copying machines to make copies of letters, notices, instructions, orders and changes in operation procedures — saving over 100 hours a month and disseminating copies faster, allowing better service for customers.

In the south, plant engineering studies at one telephone company occasionally require that an engineer carry a portable copying machine to a series of small plant assignment offices. At each of these locations the engineer makes copies of selected charts. This company's time savings amount to $21,600 a year.

In a western telephone company, several hundred copies of cable charts are needed each month for cable transfer work. A clerk formerly worked full time, hand transcribing this information. Now, copying machines do the same work in 30 minutes a day.

The variety of ways in which plant departments are saving time and money by using copying machines include:

Plant Engineering Studies: — Instead of making a special trip to the plant assignment office to hand transcribe data from charts, the engineer works on other phases of the study while a copy is sent to him.

Cable Transfer Work: — Previously, a transfer list was written from information on a cable chart. Now, a copy of the chart serves as the transfer list. Transfer lists are disseminated to field forces up to eight times faster and at one-fourth the cost when copying machines are used, according to the 3M company, which makes "Thermo-Fax" electric copying machines.

Cable Failures: — When information on cable charts is needed to repair cable failures, copies are made on the copying machine and sent to

the local testing room. Transcription errors — which often occurred when this detailed information was hand copied — are eliminated.

Special Communications Investigations and Central Office Main Frame Checks: — When pair connections have to be matched with physical connections a copy of the chart is sent to the frameman.

A more general copying application in the plant department is the duplication of orders, instructions, notices, safety tips and changes in operation procedures which pertain to maintenance, repair, installation.

Anchor & Fastener Catalog

A NEW pocket size catalog listing the complete Diamond line of anchors and fasteners for masonry and hollow walls has been announced by Diamond Expansion Bolt Co., Inc. It covers: "Red Seal" machine screw anchors, Diamond "P" lag screw expansion shields, Keystone machine bolt expansion shields, "4-D" closed back machine bolt expansion shields, "N" star type masonry drills, Multi-Size wood screw anchors, Super-Grip stud type expansions, D H D hammer drive anchors (nail type). DI-Forge percussion type masonry drills, RAM heavy duty lead-iron anchors, Diamide carbide tipped masonry drills, and "Wing-Ding" hollow wall screw anchors. Write for Catalog #160, *Diamond Expansion Bolt Co., Inc., Dept. TE&M, Garwood, N. J.*

Potentiometer Selector Chart

A PRECISION potentiometer selector chart is now available from Spectrol Electronics Corporation.

The chart, measuring 24″ x 30″, is suitable for wall mounting. It contains complete and easily read specifications including electrical, mechanical, mounting, special features and environmental information on 37 standard models of single and multiturn precision potentiometers.

Additional free copies are available from *Spectrol Electronics Corporation, 1710 South Del Mar Avenue, Dept. TE&M, San Gabriel, California.*

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Koiled Kords* retractile cords in new attractive colors are brighter, smarter and more pleasing than ever.

Koiled Kords Inc., also sells WB TELECORDS in black and color. Delivery from stock.

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Optimism Reigns at 12th Annual Convention Of The Louisiana Telephone Association

By H. J. BROUILLETTE,
Assistant Secretary,
Louisiana Telephone Association

WITH visitors and representatives from 17 states, the Louisiana Telephone Association held its 12th Annual Meeting and Convention on February 24-25, at the Jung Hotel in the heart of New Orleans. While the crowds on the outside watched and participated in elegant Mardi Gras parades, leaders of the telephone industry from Louisiana and neighboring states met to learn more about their chosen career and to discuss the problems which are common to each of them. A note of optimism was obvious at all of the major addresses and the general feeling appears to have been that the opportunities in the telephone industry are with us. The question is whether its leaders can meet the task of properly handling these opportunities.

The meeting was called to order on the morning of February 24 by *L. C. Turnley* of Kaplan, president of the association. *Victor Schiro*, Councilman at Large of the City of New Orleans, welcomed the group to the city. He presented Turnley with the key to the city, together with a certificate declaring him to be an honorary citizen of New Orleans.

At the February 24 business session, *John A. Brady, Sr.*, of the Lafourche Telephone Co., and *Jane J. LeBlanc*, of the Delcambre Telephone Co., were re-elected to 4-year terms on the board of directors; *Helen S. Prevey*, of the Elizabeth Telephone Co., was also named to the board.

Post Discusses Public Relations In The 60's:

THE PUBLIC Relations Director of the Southwestern States Telephone Co., Brownwood, Texas, R. L. (Dick) Post delivered the first address of the February 24 session. His address, "Public Relations in the Sixties," included a compilation of facts which interested and in many cases surprised the group. Stressing the role of public relations in the telephone industry, Post, although optimistic about the coming decade, pointed out that telephone people will have to get out and work if they expect the industry to keep pace with other industries in getting more consumer dollars, Post said.

► *"In* 1930 *(in Louisiana), average family income amounted to* $1,796.95 *while this figure had increased by* 1956 *to* $5,198.40. *This is an increase in family spendable income over this* 26 *year period of* 189 *percent. What happened to our revenue per telephone? In Louisiana, it increased from* $40.48 *in* 1930 *to* $70.09 *in* 1956, *or an increase of* 73 *percent. In other words, while the average family spendable income was increasing in Louisiana by* 189 *per-*

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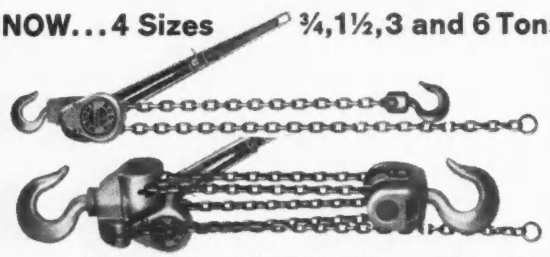
NOW... 4 Sizes ¾,1½,3 and 6 Tons



WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6 ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 14 lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

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You want *treated* wood, of course. But be sure to specify *Penta-treated*, the *clean* wood preservative that protects your pole investment. Write for informative data on Penta, and a list of treating plants in your area.

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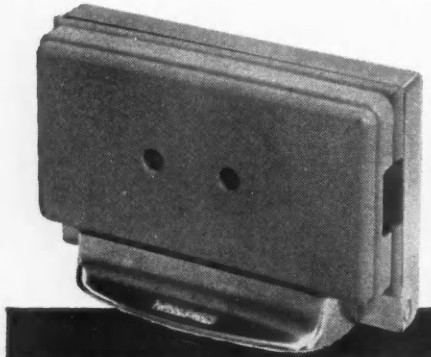

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. . . outmodes all other methods of telephone installation

Model No. 104 — shown with standard telephone equipment — accommodates up to 8 No. 44-A Western Electric connecting blocks (4 on each side). Model No. 102 takes up to 6 (3 on each side), or if desired, the back of the Floor-Con can be used for external ringers, buzzers, or auxiliary equipment. This allows the desks and furniture to be free from all telephone equipment.

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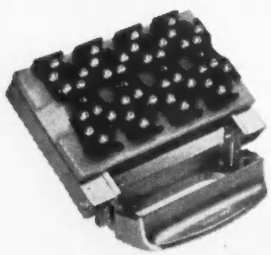

The fabulous FLOOR-CON allows phones to be connected entirely independent of office furnishings. Furniture may be moved or replaced without incurring expensive telephone changes. Gone are the clutter of equipment from desks and walls, and the needless marring of furniture.

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cent, our share increased by only 73 percent.

"To put this another way, in 1930 the average family in Louisiana was spending 2.25 percent of its spendable income on telephone service, while in 1956, this average Louisiana family was spending only 1.35 percent of its spendable income with the telephone company. Will our share of the dollar continue to decrease during the 60's? By 1970, nine out of ten families in the United States will have discretionary income. But, will they be spending it with the telephone company?"

Post expressed a firm belief that the success of public relation programs will determine the success or failure of the telephone industry in getting its share of the consumer dollar.

Clements Stresses Importance Of Telephone Industry

THE SECOND speaker of the February 24 morning session was *Ernest S. Clements* of Oberlin, a member of the Louisiana Public Service Commission. Clements emphasized that as the State of Louisiana goes through the present period of tremendous industrial growth, the telephone industry must keep pace.

He said that the Mississippi River, once considered a liability to the state, is now the key which has opened the doors of economic opportunity. He explained that Louisiana's natural resources give it a great potential and that the state's future success will depend upon sensible use of these resources.

Clements stressed that "we owe it to future generations to adopt and carry out conservation measures which will assure maximum realization of the state's potential."

Directors Meet, Officers Re-Elected for Second Term:

THE association's board of directors met at noon on February 24 and after taking up several matters concerning future association activities, *L. C. Turnley*, association president and chairman of the board, called for the election of officers for the

1960-61 association year. The Board unanimously elected the present officers.

In addition to Turnley, other officers are: *Fred N. Banker,* East Ascension Telephone Co., first vice president; and *Earl J. Conrad,* Breaux Bridge Tel. Co., second vice president.

The February 24 afternoon session opened with an address by *F. M. Fister,* chief engineer, Southern Bell in Louisiana.

Fister began by dispelling the popular inaccuracy that the telephone industry is non-competitive by virtue of it being a regulated monopoly. Two vital areas, in his opinion, are very competitive and the industry's success in meeting this competition will determine the extent of its future economic gains. Those areas are: (1) The competition with the products and services of other industries for the customer's dollar; and (2) competition in the money market for the investor's dollar.

Objectives Common To REA and Independents

THE FIRST speaker of the final session was *Ralph J. Foreman,* deputy administrator, Rural Electrification Administration. Discussing "Our Mutual Objectives," Foreman's talk was complimentary to Louisiana REA borrowers. He said that Louisiana's record in providing service is an example of the kind of foresight that has made rapid expansion possible in the telephone industry.

The Louisiana Independent companies, said Foreman, have pioneered better service through microwave installation, buried plant, subscriber carriers, and many other innovations. Getting specific as to Louisiana telephone loans, he said:

► *"Your REA loans amount to more than* $16 *million. About* 13 *million of that has already gone into* 55 *modern dial exchanges and hundreds of miles of new line. More than* 32,000 *subscribers will benefit from REA loans made to your companies.*

"This is what the record shows for the State of Louisiana. A quick tally of national figures gives you

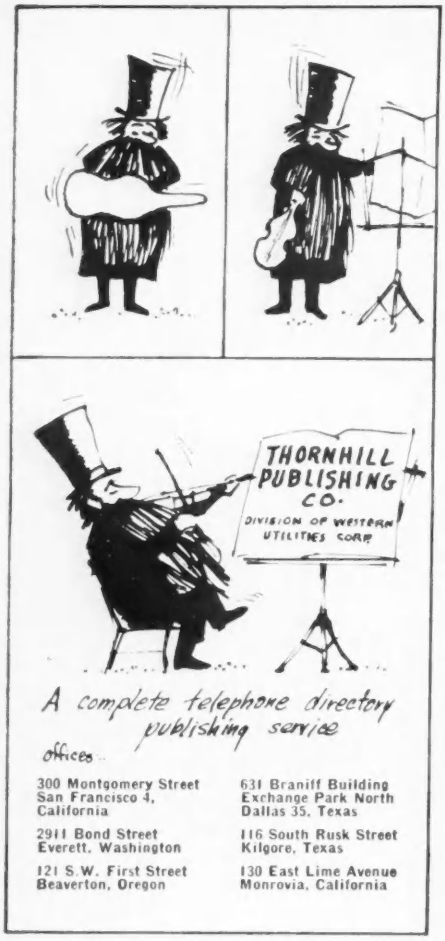
"Off The Board"

Communications Securities

Markets as of March 29, 1960

	DIVIDEND	BID	ASKED	LAST SALE
American Tel. & Tel.	3.30			88¾
Anglo-Canadian Tel. Brit. Col. & Dom. Rep.)	1.20	33¼	34	
Bell. Tel. Canada	2.20			46
British Columbia Tel.	2.20	45	45¾	
Calif. Interstate Tel. (Calif., Nev.)	.70	13⅝	14	
Calif. Pac. Util. (new) (Calif., Ore., Nev.)	.90	19¼	19¾	
Calif. Water & Tel.	1.28	26⅝	26⅞	
Carolina Tel. & Tel. (Caro.)	1.60	37½		
Central Elec. & Gas (Minn., Ill., Ia., Wis., Va.)	1.00	23⅝	24	
Central Telephone (Minn., Ia., N. C., Va.)	.88	21¼	21¾	
Chenango & Unadilla Tel. (N. Y.)	1.20	27	28	
Cincinnati & Suburban Tel. (Ohio)	4.50	90	91	
Citizens Utilities (Calif., Pa.) "A"	stk. only	13⅞	14¼	
Citizens Utilities (Calif., Pa.) "B"	.52½	12	12¼	
Commonwealth Tel. Co. (Pa.)	.90	20	20¾	
Florida Telephone Co.	1.00	26¾	27½	
Gen. Tel. & Electronics	2.20			78½
Hawaiian Tel. Co. (Hawaii)	1.00	20⅝	21⅛	
Indiana Telephone Co. (Ind.)	.50	22	—	
Inter-County Tel. & Tel. (Fla.)	2.00	60	65	
Inter-Mountain Tel. (Va. & Tenn.)	.80	15¾	16⅛	
Jamestown Tel. (N. Y.)	5.60	81	—	
Lincoln Tel. & Tel. (Neb.)	2.60	63	—	
Lorain Tel. Co. (Ohio)	1.40	33	—	
Middle States Tel. Co. (Ill.)	1.00	25	26	
Mountain States Tel. (Ariz., Colo., Mont., Tex., etc.)	6.60			176
New England Tel. & Tel. (New England states)	1.72			35½
North Carolina Tel. (N. C.)	none	1 5/16	1 7/16	
Northern Ohio Tel. (Ohio)	1.60	53	56	
Pacific Tel. & Tel. (Calif., Wash., Ore., Nev., Ida.)	1.14			29⅛
Peoples Telephone (Pa.)	4.00	90	—	
Pioneer Tel. Co. (Minn., N. D.)	1.00+stk	35½	37	
Rochester Telephone (N. Y.)	1.00			24⅞
Southeastern Tel. (Fla.)	.90	20½	21½	
Southern New England Tel.	2.20	44½	45	
Southern Nevada Tel. (Nev.)	1.00	20¾	21¾	
Southwestern States Tel. (La., Ark., Okla., Tex.)	1.20	23⅛	23½	
Tel. Serv. Co. of Ohio "A" (Ohio)	2.80	143	—	
Tel. Serv. Co. of Ohio "B" (Ohio)	2.80	148	—	
Tidewater Telephone Co. (Va.)	1.40	25	—	
United Utilities	1.40	38½	39	
West Coast Tel. (Wash., Ore., Calif.)	1.20	23½	23¾	
Western Union Telegraph	1.40			52
Western Utilities	.36	7⅜	7⅞	
Western Light & Tel. (Mo., Ia., Kans.)	2.00	41½	42¼	

(Source of Market — DEAN WITTER & CO.)



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some basis for evaluating your own progress. You are part of a nationwide program that benefits all of rural America."

Foreman emphasized that REA's real interest is in people — the telephone subscribers. He explained that service to farm families is the principal of the mutual objectives of REA and the independents. He pointed out that 10 years ago less than one third of the nation's farms had telephones and today the figure is about two thirds. The 1950-60 decade has been by far the greatest decade ever in rural telephone expansion. This, Foreman said, was made possible by REA loans, technilogical advances, and the cooperation of various segments of the telephone industry.

Pearce Brings USITA Greetings

THE FINAL convention speaker was *Clifford C. Pearce*, president of the Farmers' Telephone Co., Riceville, Ia., and first vice president of the U. S. Independent Tel. Assoc.

Pearce discussed the opportunities afforded Independent companies by USITA. He emphasized that in the field of federal legislation, that organization continues to be the industry's watchdog. He called for the help of the Louisiana companies in continuing the fight for repeal of the federal excise tax on telephone service.

"Perhaps USITA's greatest achievement during the past year," said Pearce, "was in the area of toll compensation settlements. The agreement reached in 1959, resulting from long negotiations between that organization and representatives of the Bell System means an annual increase in toll compensation of approximately $12 million based upon 1959 overall toll traffic volumes."

"This accomplishment," said Pearce, "did not come easily. It resulted from perserverance and hard work by representatives of the association who were well prepared and very dedicated in their efforts." Pearce made a direct appeal to nonmember Lousiana companies to become a part of the national organization.

Fayette, Ala. Selects "Man & Woman of Year"

W. J. HOLLADAY, general manager of Alabama Telephone Co., Fayette, Ala., and Mrs. E. L. Bagwell were selected as Fayette's "Man and Woman of the Year" recently by the Fayette Exchange Club and Progress Club No. Two at a banquet attended by more than 100 people.

Dr. C. T. Sharpton, vice president of student affairs at the University of Alabama, was the guest speaker. Introduced by Jack Black, Dr. Sharpton discussed "the dire need for dedicated leadership."

Mrs. Bagwell has taken an active part in nearly all of the community drives and projects in Fayette. She has been especially active in youth work, March of Dimes, Red Cross, mental health, Garden Club, church work and Crippled Children's Clinic.

GUTHRIE SMITH (left), mayor of Fayette, Ala., presents awards for "Man and Woman of Year" to MRS. E. L. BAGWELL and W. J. HOLLADAY, manager, Alabama Tel. Co.

Guthrie Smith, Fayette mayor, who made the awards, said of Holladay, "Not only does this man join organizations, he soon rises to the head of them."

Holladay is serving as president of the Lion's Club. He is a past president of Rotary, Lion's Club, Northwest Alabama Shrine Club, Alabama-Mississippi Telephone Association, Fayette Chamber of Commerce and others.

Mayor Smith said Holladay's greatest achievement was the taking over of the lagging Fayette Chamber of Commerce in 1954-55. Holladay surveyed the situation and went to work. Out of his efforts and the cooperation of the Chamber of Commerce, the Fayette Manufacturing Co. was lo-

cated in Fayette to become the city's largest industry.

As chairman of the agricultural committee of the Chamber of Commerce he has been active in a rural community development program. This program has offered needed encouragement to rural communities to better their living conditions.

The mayor praised the job Holladay has done and is still doing with the Fayette Planning Commission, of which he is chairman. The commission, set up in 1957, has as its function and duty to make and adopt a master plan for the physical development of Fayette.

Mr. Holladay is a long time deacon in the Church of Christ. A native of Tennessee, he married the former Miss Lula Pope of Pikeville. They are the parents of a son, Charles Holladay, of Atlanta, Ga., who is a professor of engineering in a southern college.

Record 1959 Earnings Reported By United

RECORD revenues and net income were reported by United Utilities, Inc. in 1959, preliminary figures show. In a statement issued last month the company stated net income applicable to the common stock, after minority interests, was $4,920,374, equal to $2.09 a share on the common stock, compared with $3,724,467, or $1.67 a share in 1958. The earnings were based on the 2,350,378 average number of shares outstanding during the year, compared with 2,226,538 average shares in 1958. Total operating revenues were $42,439,061, compared with $38,147,657 in 1958.

Directors voted the regular quarterly common dividend of 35¢ a share payable March 31 to holders of record of March 7.

Stravers Announces Name Change For Calhoun Tel.

THE CALHOUN County Telephone Co., Homer, Mich., has officially changed its name to the "Calhoun Telephone Co.," according to an announcement made by Manager Joe Stravers.

According to Stravers, "the name-

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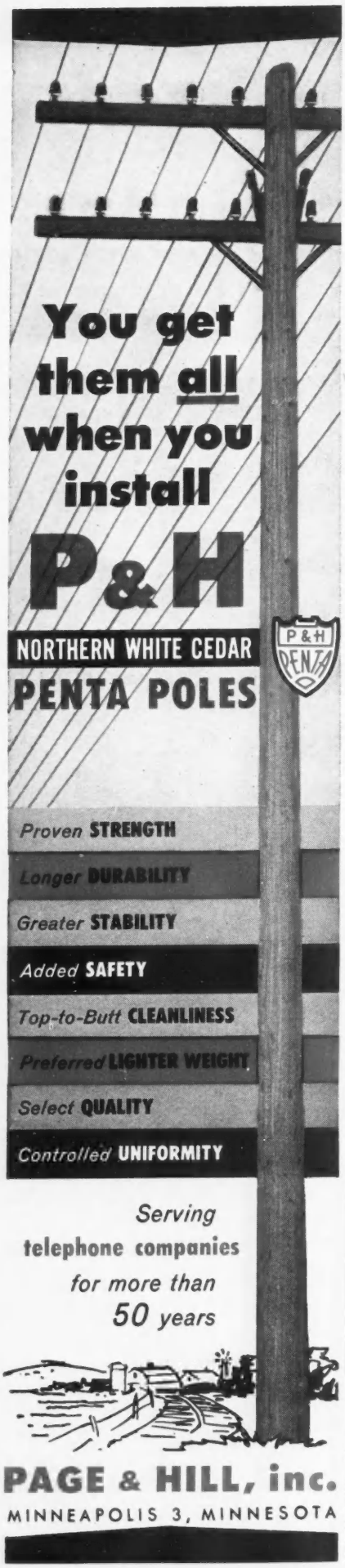

change came about as the result of Calhoun's expanding operations."

"When the Rollin Telephone Co. (Addison exchange) in Lenawee County was purchased by Calhoun last June," he said, "the company's operations were no longer limited to Calhoun County, thus requiring the deletion of the word 'county' in the company's official name."

The Calhoun Telephone Co. includes the Addison, Homer and Tekonsha exchanges, serving more than 3,300 subscribers.

The company was incorporated in 1903 as the Homer Telephone Co. and by 1904 was providing telephone service to 244 subscribers. In 1911, after purchasing the Tekonsha exchange, the company changed its name to The Calhoun County Telephone Co., serving 865 subscribers.

In 1955 the company came under a new management and during the past four years its owners have spent more than $650,000 in improving its facilities and in converting the system from manual to dial service.

Stravers also announced that during the next five years the company plans to invest nearly $700,000 in improving and expanding its services in the Addison, Homer, and Tekonsha exchanges.

Northern States Power Co. Completes Minot Cutover

A "TRIPLE BARRELED" cutover has been completed by Northern States Power Co. of Minot, N.D. The $175,000 project involved changing an old five-digit system to 2-5 numbering, and placing two new community dial exchanges into service, simultaneously.

Minot, a city of 34,000, went dial in 1948 with 4,000 lines and 5,800 terminals. Now, the city's facilities feature 8,700 lines and nearly 13,000 terminals. The new central office equipment, manufactured by Automatic Electric Co., Northlake, Ill., provides extended area service to the two unattended dial offices in neighboring Surrey and Burlington. Both offices contain 70 lines, 200 terminals-per-station, and superimposed ringing services.

Future additions have already been slated for Northern States Power Co.'s growing system. According to W. R. Williams, local manager, Minot will gain equipment for 1,000 lines and 1,600 terminals and Burlington 60 lines and 100 terminals — all by mid-1960.

Much of the company's rapid growth is attributed to the U. S. Air Force Defense Command, Strategic Air Command Base, Aircraft Control & Warning Base and U. S. Army Missile sites located within Minot's Ward County limits.

Independent Tel. Corp. Purchases Two Companies

INDEPENDENT Telephone Corp., Dryden, N. Y., has acquired two additional operating telephone companies in Michigan, William B. Harrison, Independent's president, announced last month.

Independent's new Michigan acquisitions are Lake City (Mich.) Telephone Co., and Northern Telephone Co., Hale.

Harrison also said that Julius Fleischmann, financier and philanthropist of Cincinnati, Ohio, and Chauncey P. Williams, Jr., New York City attorney, have been elected directors. Robert A. Russell, New York City, was elected treasurer and William C. Wood, of Dryden, was elected controller of the corporation.

Independent Telephone Corp., a telephone holding company formed in Sept., 1955, owns or is affiliated with 15 telephone operating companies providing service to subscribers in New York, New Jersey, West Virginia and Michigan.

Symposium On Networks and Systems

THE TENTH international symposium organized by the Polytechnic Institute of Brooklyn's Microwave Research Institute will be held on April 19, 20 and 21, 1960 in the Auditorium of the Engineering Societies Building, 33 W. 39th St., New York City.

This Symposium on Active Networks and Feedback Systems is cosponsored by the Professional Group on Circuit Theory of the Institute of Radio Engineers. The support of the

Air Force Office of Scientific Research, the Office of Naval Research and the U. S. Army Signal Research and Development Laboratory makes it possible to hold this event without any charge for admission or registration.

This series of annual symposia has been attended by as many as 940 scientists and engineers in past years. Previous topics have included: Nonlinear Circuit Analysis (1953 and 1956), Modern Network Synthesis (1952 and 1955), Information Networks (1954), and four others on Millimeter Waves (1959), Microwave Techniques, Solid State Phenomena and Electronic Waveguides. As in the past, recognized authorities will summarize the present state of the art and recent outstanding advances will be presented by research workers from university, industrial and government laboratories throughout the world.

Abstracts of all papers, a detailed program and registration form are available from: *The Microwave Research Institute, Polytechnic Institute of Brooklyn*, 55 *Johnson St., Brooklyn* 1, *N. Y.*

Canadian National Names Moores, Plant Supervisor

SAMUEL A. M. MOORES, World War II hero of the RAF and a native of Freshwater, Carbonear, has been appointed plant supervisor for Canadian National Railways communications department, St. John's, Newfoundland, according to A. C. Jerrett, superintendent of telegraphs.

Moores joined the Royal Air Force in July 1941 after completing his education at Freshwater High School and Memorial University summer school and teaching school for a year at White Bay.

After completing training as a wireless operator air gunner, he was posted overseas to Bomber Command early in 1942, serving on heavy bombers in No. 10 Bomber Squadron and later with No. 35 Pathfinder Force Squadron.

On May 13, 1943, he was shot down on his 34th operational mission and was taken prisoner of war for 23 months. He escaped while on a

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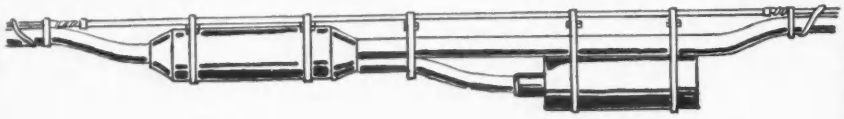

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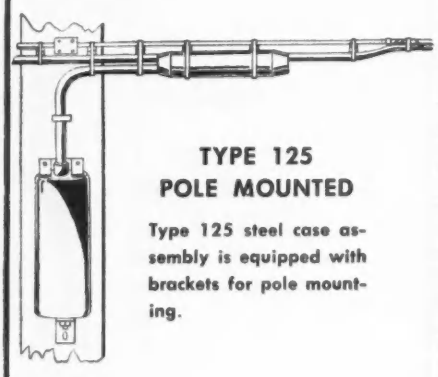
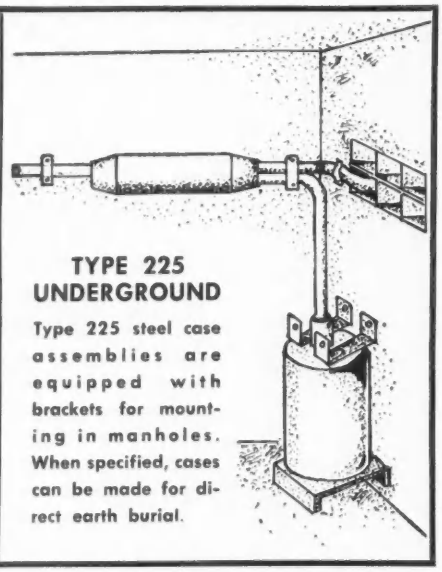
STEEL CASE ASSEMBLIES

- ALL LEAD STUB ASSEMBLIES ARE PRESSURIZED
- ALL PLASTIC STUB ASSEMBLIES ARE HERMETICALLY SEALED



TYPE 125
POLE MOUNTED

Type 125 steel case assembly is equipped with brackets for pole mounting.



TYPE 225
UNDERGROUND

Type 225 steel case assemblies are equipped with brackets for mounting in manholes. When specified, cases can be made for direct earth burial.

Voice frequency coils, type 632(88MH) and 638(44MH) are primarily designed for use on two wire telephone cables. Types MF10, MF11, 641 and 642 coils are furnished for quadded interoffice and toll cables. Special coils can be made to meet other requirements.

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forced march from Koenigsburg to Hanover and returned to England in April 1945.

After the war he took up a post of equipment technician with the Newfoundland Department of Posts & Telegraphs in 1946. Two years later he joined Radio Engineering Products, Montreal, and returned to his native province to join CN Telegraphs in 1949.

He has been installer, equipment maintainer, district equipment maintainer, repeater attendant, T and R instructor, installation inspector, equipment inspector and assistant plant supervisor with the company.

He and his wife and their three children live in St. John's.

Creston Mutual Tel. Buys Kent Mutual Lines

SALE of the Kent (Ia.) Mutual Telephone Co. to the Creston (Ia.) Mutual Telephone Co. was announced last month.

Details of the negotiations, which have been under way for several weeks, were completed by Harold Gustin, president, and Gaile Cook, secretary, on behalf of the Kent Mutual Telephone Co. and T. P. Roberts, president, and F. G. Carlson, secretary and general manager of the Creston company.

Operation of the Kent exchange will continue as it has been operating, Carlson said. Work on converting Kent to dial phones will start immediately, and it is planned to make the conversion in about a year.

There are about 125 telephones in the Kent exchange.

H. A. Bishop Dies

HAROLD ARTHUR Bishop Sr., 72, president of the Starke (Fla.) Telephone Co., died February 5, after an illness of several months.

Mr. Bishop was born in Great Bend, Kansas on May 18, 1887. He went to work for the Bell System in 1903, and was a cable splicer and manager of several Florida exchanges until 1919 when he purchased the Starke exchange. When he bought the exchange it was magneto operated and had 97 telephones. Mr. Bishop lived to see the company grow until

it had three automatic exchanges serving 1,700 stations. He retired from active duty with the company last May.

Mr. Bishop is survived by his widow, Lillian Turner Bishop; one son, Harold A. Bishop Jr., and two daughters, Mrs. William C. Powell and Mrs. Nina R. Andrews, all of Starke; a sister, Mrs. Mary Naff of Theyer, Kansas, and five grandchildren.

Andrew Sabo Joins Buckeye Tel. & Supply

APPOINTMENT of Andrew Sabo as field representative of Buckeye Telephone & Supply Co., Columbus, Ohio, has been announced by R. L. Hepner, general sales manager.

ANDREW SABO

Sabo has been assigned the Indiana, Eastern Illinois and Northwestern Kentucky area. He has had 12 years selling experience, both in the operating field and in the distribution field. He was sales and service representative for Michigan Bell Telephone Co., Detroit, for five years, and was a distributor salesman for Graybar Electric Co., Chicago, Ill.

Engineering Conference Extends Application Date

THE USITA Telephone Engineering Conference at Michigan State University has extended its application date to May 15th rather than the final date of March 30th that was listed in the descriptive brochure mailed out earlier this month.

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You've got the means... your power hole-digging equipment. Use it to install Chance Screw Anchors in 5 to 8 man-minutes... *from the time the equipment is moved into position until the anchor is ready for the guy.*

Chance Power-Installed Screw Anchors, ranging from 78 to 176 square inches in area, go down fast into all types of soil (except extremely rocky soil). The sharp cutting helix of high-strength structural steel is tapered to minimize earth disturbance. And, hundreds of installations and pull tests prove these anchors hold more with less creep than any anchors of comparable size.

Your present power boring equipment, regardless of type, can be easily adapted to power anchor installations. Add to this equipment... the special wrench shown at right. It transmits torque from the power equipment directly to the specially designed hub on the anchor helix. Wrenches are made to fit all popular makes of earth borers. And, since the anchor rod is not subjected to torque, it only has to be heavy enough to support the guy load. That's a cost-saving factor too.

So, mechanize screw anchor installations. Install Chance Screw Anchors, and get:

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Consistent results
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Less physical effort, better employee relations

Contact your Chance Representative. Now. He'd like to tell you more about mechanized anchor installation, show you test results and help you apply this new technique to save time, cut costs, and improve your anchoring.

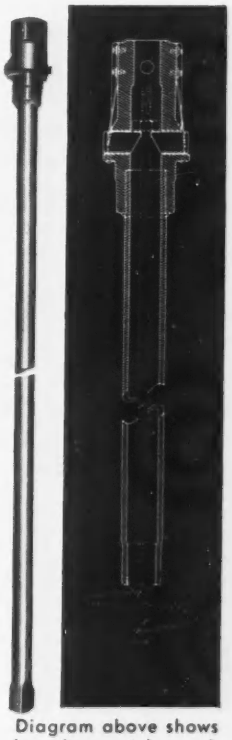

Diagram above shows how the special wrench fits the anchor. Wrenches are made to fit all popular makes of earth-borers.

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VALUATION ENGINEERS (2) for permanent positions as specialists with Federal Communications Commission, Washington, D. C., GS-12 $8,810 to GS-13 $10,130. Must be graduate electrical engineers with good knowledge of telephone plant. Experience in depreciation (studies of plant service lives and other factors) or separations fundamentals preferable but not essential. Government will pay expense for transportation of employe, his family, and household goods to Washington. Attractive fringe benefits include retirement, life and health insurance, periodic salary increases. Good opportunity to enter government career service. Reply with Standard Form 57 to PERSONNEL OFFICER , FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON 25, D. C.

A LARGE, growing Telephone Company ideally located in Florida has immediate openings for experienced Traffic Engineers as follows — Toll Traffic Engineers, Toll Line Engineers, and Dial Equipment Engineers. Salary commensurate with experience and qualifications. Please send resume and photograph to Box 109, TE&M, 7720 N. Sheridan Rd., Chicago, Ill.

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MAGNETO TELEPHONES — Leich 901 wall or desk magneto telephones. Cleaned, tested and guaranteed, $16.50 each. As removed from service $15.00 each. Turtle Lake Tel. Co., Turtle Lake, Wisc.

USED NORTH McBerty All-Relay System — Equipped with four or five hundred lines — ten party selective ringing — eight E & M lead trunks. Reply to Box No. 107, c/o TE&M, 7720 Sheridan Rd., Chicago 26, Ill.

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(Continued from page 125)

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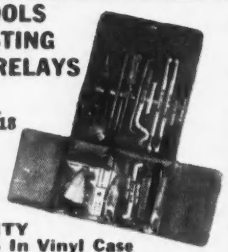

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PUBLISHED BY STROMBERG-CARLSON
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STROMBERG-CARLSON

News and views of Independent telephone people VOLUME 9, NO. 1 • APRIL, 1960

Talking over, not just talking about, Electronic Switching. These push button telephones with tone signaling are part of the AN/TTC-12 Electronic Communications Center delivered to the Signal Corps by Stromberg-Carlson. From left, Colonel Robert F. Wilson, commanding officer of the Ft. Monmouth Procurement Office; James D. McLean, president of Stromberg-Carlson; Allan R. Shilts, vice-president and general manager; John H. Voss, vice-president, Telecommunication Division.

Electronic Switching a Reality

"Long before I knew that I would be joining Stromberg-Carlson, I was fully aware of the tremendous lead this company had taken in the field of Electronic Switching.

"It was an exceptional privilege for me to be on hand when the first complete electronic communication switching center ever built was delivered to the contracting authority on February 19, 1960."

This from James D. McLean, new president of Stromberg-Carlson and a senior vice-president of General Dynamics Corporation.

As a former chief executive of Hoffman Electronics Corporation, Mr. McLean was in a position to know and evaluate the progress made by several manufacturers now doing research in this new approach to communications. He knows full well the wide gap which separates research from a fully-operative system, packaged for its intended use, and ready *on the shipping platform.*

The unit delivered in February — known as the AN/TTC-12 — is a 200-line local switching center. Two other complete systems follow: the AN/TTC-13 long distance switchboard and the AN/TTC-15 tandem (or divisional area) switchboard. All operate at the speed of light, for maximum efficiency and dependability. Each, because of its modular construction and plug-in printed circuitry, offers the maximum flexibility so necessary to the military.

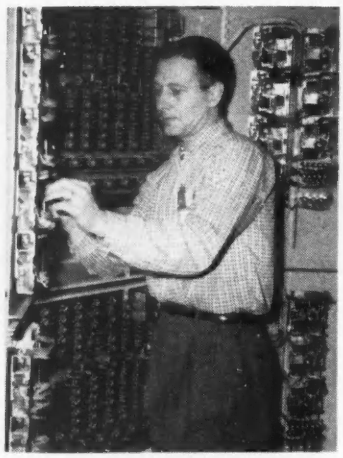
As part of the total communications system, Stromberg-Carlson also has delivered the first electronic telephone instrument employing push buttons and tone signaling in place of the usual rotary dial.

Robert Reasner, wire chief, in foreground, checks over Chambersburg toll ticketing test panel. Looking on are J. G. Siemons, general plant manager; B. M. Free, district manager; Joseph Ottalagana, sales manager, Stromberg-Carlson Rochester Branch; and W. E. Mentzer, construction superintendent.

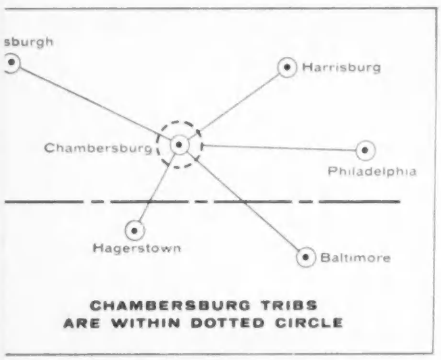
Chambersburg, Pa., area dials direct to the nation

Dwayne White, center, and J. V. Gasper, Stromberg-Carlson technicians, explain function of magnetic recorder to United district manager B. M. Free.

To the newspaperman the sign "-30-" means the end of the story. However, in southern Pennsylvania, route signs for U. S. Highway 30 which runs into Chambersburg, indicate something different to a telephone man. The story there is just beginning.



Harper Shoop, United of Pennsylvania central office man, performs final adjustment on a Deca switch of register-sender in Chambersburg exchange.



CHAMBERSBURG TRIBS ARE WITHIN DOTTED CIRCLE

For several years the United Telephone Company of Pennsylvania has operated the Chambersburg exchange as a large XY® Dial office with its own toll center, serving many surrounding towns. Traffic studies indicated that the increasing load from normal growth and greater toll usage could now be handled most efficiently by Direct Distance Dialing.

The United Company has installed Stromberg-Carlson XY Toll Ticketing to provide that service. Chambersburg and seven neighboring exchanges having Extended Area Service can now dial directly to the nation.

Finding a reason for the stepped-up traffic load is easy. All around the Chambersburg area are major cities which have important and frequent ties to local business. Pittsburgh is just 125 miles west of Chambersburg; Philadelphia, the same distance east. Baltimore and Hagerstown, Maryland, are even closer to the south.

To cut holding time — the principal expense in toll traffic — and to speed subscriber service, the United Company has run direct trunks from Chambersburg to each of these cities. Twenty-seven trunks have been run to the state capital, Harrisburg, which is the area outlet for nationwide DDD.

More than 20,000 United subscribers in southern Pennsylvania are already benefiting from this progressive move. Soon subscribers of the Mercersburg exchange will also enjoy this same DDD service.

Arthur Eckert, left, and Robert Reasner are impressed by the subassembly packaging in the identification equipment of the Chambersburg XY Toll Ticketing system.

California Interstate continues pioneering work; extends dial service to Wrightwood, Calif., area

Willard Wade, left, president of California Interstate Telephone Company, discusses Wrightwood construction with foreman Len McLaughlin, seated, and C. H. Harling, district manager.

Willard Wade tests connections between his office in Victorville and new facilities in Wrightwood.

A long time back, pioneering into the West was quite an ordinary thing. It's rarer now, but a few Western pioneers still exist. The California Interstate Telephone Company is one.

Offered the opportunity to extend fuller service into a Southern California area, California Interstate Tel jumped at the chance. The region around Wrightwood, Calif., had been served by the Pacific Telephone and Telegraph Company from another exchange. After negotiating with that company and obtaining approval from the Public Utilities Commission, California Interstate took over the Wrightwood area franchise.

An early January date was set for the company to create an exchange where none existed and begin their service. To do this a tight schedule had to be met.

Willard Wade, California Interstate president, directed the program to provide service by the agreed date. Construction was immediately begun on the Wrightwood exchange building. The company had already looked for a manufacturer who could engineer and install a completely reliable dial system within the contracted time. Stromberg-Carlson got the job.

Sales personnel from Stromberg-Carlson's Burlingame office combined their efforts with engineers, production men and installers. Drawing on their experience in meeting deadlines, these men were able to fully equip the Wrightwood exchange with an XY® Dial system ahead of the required schedule.

During the installation, dozens of area residents, never before given the opportunity for telephone service, clamored for stations. Soon service requests boosted the number of stations to twice what it was previously.

To make the connection between Wrightwood and the company's long distance center in Victorville, an unusual microwave setup was necessary. A large reflector screen on a mountain side adjacent to Wrightwood served to surmount the intervening peaks. Signals are beamed from a tower at the Wrightwood office up to the reflector and over the hills to Victorville.

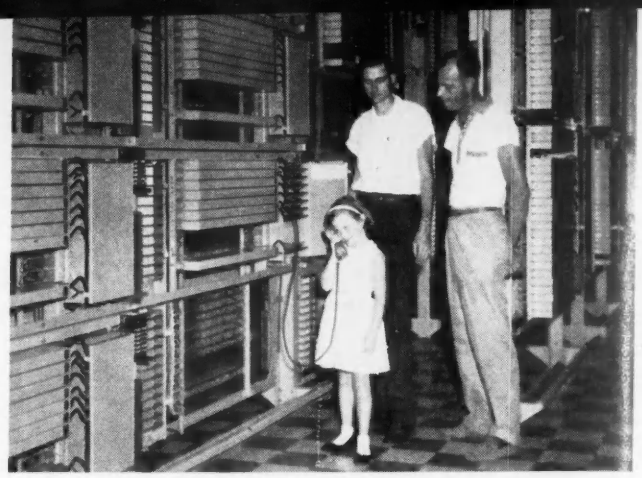
The enterprising job done at Wrightwood clearly indicates the progressive nature of California Interstate Telephone Company. Whenever possible, the company has acquired limited service areas and developed them into strong exchanges. Of its more than 20,000 subscribers, 95% are receiving dial service. It is expected that the entire California Interstate network will be dial-served in the near future.

The company operates 24 exchanges in California and Nevada, the largest being Victorville, California, which is its home office.

Paul Anderson, Stromberg-Carlson installer, looks over XY Dial layout just before the cutover.

Posies Pay

An attractive pay station is an invitation to neatness. People think twice before throwing paper and other articles around an area others have made an effort to beautify. By the same token, a neat booth invites prospective callers.



"This line sounds fine to me." Lee Loosier, granddaughter of W. L. New of Commerce, makes some routine tests for J. E. (Phil) Harris, equipment supervisor, and Ed Willbank, C.O.E. man, in 1,100-line XY Dial office.

Postman's Holiday No. 8

Mills and mountains where

Georgia meets Carolina

The largest state east of the Mississippi River — Georgia — combines the traditions associated with the Old South, and the muscle-flexing of a young man holding his first pay check. At first glance it takes on the turbulence of an oil-and-water emulsion, but as you look deeper you can see the first signs of a blend. There is no question about the emergence of a strong, well-balanced economy, but the process has its accompanying tensions.

Cornelia

These conflicts between old and new were minimized in the small slice we took off the top of the state. In *Canton*, for instance, you find the typical Fall-Line city, dependent upon textile mills. These have run a successful business for a long, long time; whether boom or depression days, the Canton Mills never lacked for business, since their product is the denim for blue jeans.

A large part of the city is mill-owned and operated, with fine homes on well-shaded streets, and a separate water and fire department. Telephones, however, are the sole responsibility of the A. A. Finchers, father and son, who built up the Canton Telephone Company from two toll lines and a rented switchboard in 1903, to the 3,000-station XY® Dial office cut into service two years ago. The older Mr. Fincher, who at 80 seldom misses a day at the office, remembers the long, lean years when you counted yourself lucky to meet current bills. Any "salary" came from outside jobs.

The younger Mr. Fincher, as general manager, has the equally challenging task of providing the top grade service expected when your next door neighbor is the Bell Company. He and Robert Boettger, plant superintendent, and Jack Payne, equipment supervisor, run a smooth local operation, with provision for Direct Distance Dialing as soon as they have an outlet. The company has been outstanding, for its size, in the amount and quality of PBX service offered: for instance the F-40 at one of the Canton Mills has some key systems and 13 two-line telephones connected to it to step up efficiency. Other newer industries — chicken feed, broiler processors, marble finishing, and a college — are well served according to their present needs.

Everyone we talked with seemed surprised that we had not seen the large well-stocked Stromberg-Carlson Branch at *Atlanta*, for people from all over the Southeast have made this a habitual stopping-off place. The several trucks that pulled in to unload or pick up supplies and telephone instruments during our brief stay told us as much as the records themselves, where "shipped same day" was the usual entry.

The evening spent with Moon Mollands gave us a chance to talk over places and people, seen or to be visited. We learned what we should have known: that it isn't sales so much as service that counts; that telephone people prefer a partner working side by side with them on their long range problems, to a supplier who has only a product to sell. We also learned that an Atlanta cloudburst can stall a lot of cars!

Mr. W. L. New of *Commerce* is one half of a very respected telephone family; the other half is his brother Arlie New of Thomaston, whom we had visited on another vacation. Their father taught them to climb poles before they were 10, and they've never lost their enthusiasm for the business.

In 1949 W. L. New sold out his share of Thomaston to his brother, bought Commerce and a few other towns that showed more of promise than progress up to that point. In the next 10 years, each of the five

Commerce Telephone Company owns all toll lines within its service area. Busy board is directed by Hortense Benton.

Martha Mullins and Annie Ruth Fann serve customers in attractive business office at Canton.

Microwave provides weatherproof toll circuits between Franklin, Sylva and Murphy, North Carolina.

towns was given a new office building, XY Dial equipment, and all new outside plant. His subscribers have increased about 300%.

Commerce and Jefferson, the two largest, have mills turning out yard goods, factories making work clothes, an iron works, and two new electronics plants. Cotton farmers have turned to raising chickens or planting pine trees as a profitable use for marginal land. Just around the corner from the telephone office, a new factory was being rushed for Fall occupancy. Already ordered and on the way was an F-40 planned to be ready on opening day.

W. L. New, Jr., manages Jefferson; W. Hardman Jones is local manager at Commerce. The company owns its own toll lines, and the busy board at Commerce indicated the traffic load, even though it was about noon. It was amazing how quickly the streets emptied, for all who can, prefer to lunch at home.

The cordial welcome at Commerce made it hard to leave, but off in the distance we could see cool, beckoning mountains that drew us like a magnet toward the northeast corner of the state.

These same mountains had drawn Milton and Helen Stewart to *Cornelia* twenty years before. They came because they wanted to live here; then, because the telephone business was Milton's life, they acquired some property of little value and proceeded to make a company out of it. Bit by bit they have reached out, their own contagious enthusiasm touching off a spark that has kindled a new flame in the whole region.

Today it would be easy, as one sees the new factories, comfortable homes, enlarged schools, and hope in the eyes of young people who proudly call these hills their home, to say that it was inevitable. So is any good job after it's been done!

Twenty years ago in most of the 10 towns and communities now included in the Standard Telephone Company system, any call you made was a long distance call. A few phones were spotted where people gathered — the rusty iron wire led over the hills to some distant toll center, and you could just as well shout to your neighbor as use the facilities. It's different now, with 10 dial exchanges serving about 5,500 subscribers, and no one to say whether good telephone service drew industry or was the spawn of it.

Perhaps you'll be following U. S. Route 441 through the Great Smokies toward the warm beaches at Brunswick and Jacksonville; or U. S. 23 from Atlanta toward Charlotte and Washington. They cross in Cornelia. Stop in at the Chamber of Commerce — Helen Stewart will greet you. But watch how long you stay or you may never leave!

The road to North Carolina and the Smokies leaps from side to side over one of the many trout streams.

William B. Cox, vice president and commercial manager of Standard Telephone Company, joined Milton Stewart at Cornelia after many years with Alabama Telephone Company.

The Western Carolina Company has a dial exchange right in the middle of the Cherokee Indian Reservation.

Portion of the well-stocked warehouse of Stromberg-Carlson's Atlanta Branch. Efficiency and extra service are the rule here.

Harley Carpenter, district manager at Franklin and Sylva, works up a rush order for construction supplies with his secretary.

One of many beautiful mountain lakes near Cornelia. This has campsite and public beach.

At Canton Mills Miss Nan Ponder, secretary to the president, uses one of the several 1573 two-line telephones connected to the F-40 XY PBX.

Toll center for Western Carolina Telephone Company at Sylva. 10 positions grew to 16 positions and traffic is still on rise.

Postman swings around, heads north in continuing customer contacts

Portion of the Canton Mills — mainstay of this city just north of Atlanta, and an obvious factor in growth of Canton Telephone Co.

at one point touching the edge of Tekoa Gorge, skirting mirror-like lakes, knifing into mountains that have been tumbled one on top of another. This is the area where the Western Carolina Telephone Company has placed a Stromberg-Carlson microwave system between its *Franklin* office, the large XY MDO at *Sylva*, and over to another XY Dial exchange at *Murphy*. The tolls retained, rather than having to go through a distant connecting office via roundabout wire lines, have been a complete justification for the investment. In the absence of Mr. Tom Sawyer, we were met at Franklin by Harley Carpenter, district manager. He showed us where to look for the repeater station on mile-high Cowee Bald, then started us up, over, around and down to Sylva, where industry and a busy telephone office almost fill up a narrow valley.

By concentrating toll toward this central point, the Western Carolina Company has made an efficient operation; the number of positions otherwise would have been surprising for a town of this size. And during the severe storms and ice of winter these microwave circuits are weatherproof!

There's a haunting beauty about these ancient mountains. It spoke to the Red Man, too, and is captured in the drama "Unto These Hills" that plays all summer at the amphitheater in the Cherokee Reservation. Quite different in appeal is the town of Gatlinburg, Tennessee, over the Great Divide. Here for an entire Sunday we gave up our identity in the swarm of tourists — and thoroughly enjoyed the unfamiliar role . . . . even to getting lost!

Mr. and Mrs. W. L. New and son, Grant New, in the president's office at Commerce Telephone Company.

Carol Clark and Doris Stephens, clerk and cashier for Standard Telephone Company, total up receipts at Cornelia office.

Get lost; it's fun!

The map indicated that the side road would rejoin the main highway . . . . but it didn't! Instead, becoming ever narrower, steeper and more twisty, it ended on a high shoulder of the Great Smoky Mountains. Some twenty people, ranging from tiny tyke to time-worn toilers, poured out of cabins grouped around the dead end. It was a moot question who was more surprised: the lost or the found.

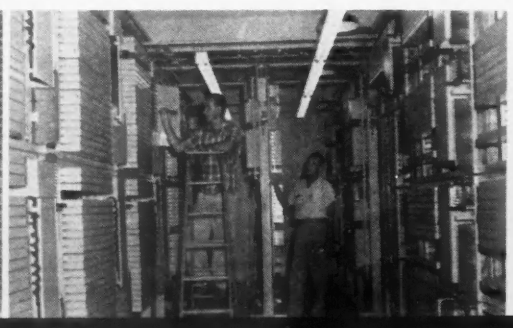
The friendliness of these folk, not yet caught up in the swirl of "modern" living, became apparent as soon as they realized our situation. Proud, skilled in the crafts which are the mark of a more self-reliant period, the mountain people drive their cars to the town to work, to shop, to sell — yet would never trade their secluded freedom where the air is clean, the view is broad, the neighbors of their own choosing.

The spell of a past age was thick upon us, when suddenly there came a familiar sound — almost jarring in this setting. It was a telephone bell! A man answered it, then rushed out of the cabin to his little woodturning shop. Quickly he began to load bowls, lamp stands and candle sticks into his pickup. A moment later he flew down the mountainside to one of the many tourist shops in town.

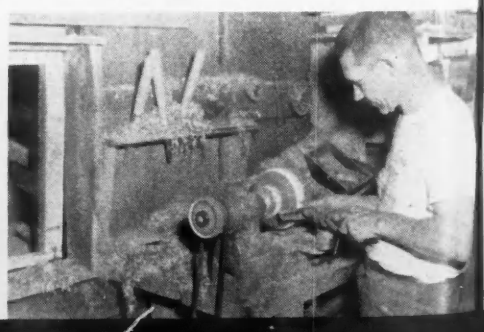
"When we truck it down ahead of time they won't buy; when we get back here they want it fast. That's why we have a telephone."

The jarring note was gone; it all made sense now.

The home workshop is typical of the Tennessee mountain people — skilled in their craft, friendly, independent.



Expansion of service into outlying areas keeps a full construction force busy at Commerce . . . . A. A. Fincher of Canton and Jack Payne, equipment supervisor, in the 2,800-terminal XY Dial room.



In East Texas, small town progress rivals "big city" growth

Lott mayor E. E. Suddith cuts the ribbon at entrance to Texas Tel and Tel Exchange. Others, from the left, are: Gerald Pievehouse, district manager; Claude Asher, former mayor; J. B. Swink, commercial manager; F. G. Winters, vice-president of Texas Tel and Tel.

Don Hoskins, left, combination man, and J. T. Maxwell, right, plant manager, both of LaWard Telephone Company, take a minute from their discussion with Carl Price and Charles Fogg of Stromberg-Carlson.

Houston is the largest city in Texas and one of the fastest growing metropolitan areas in the country. But all around this teeming metropolis, enterprising smaller towns are showing the "city-folk" what progress really is.

In Riesel, Lott, Chilton, Needville and Lolita, Texas (none larger than 1,000 population) a spirited program of advancement is producing results. Conversion to XY® Dial in each of these towns keynotes the great strides that have been taken. Three East Texas Independents are directly responsible: Texas Telephone and Telegraph Company; the Fort Bend Telephone Company; and the LaWard Telephone Company.

Texas Tel and Tel, based in Houston, is setting a fast pace in dial conversions. Their three latest cutovers at Riesel, Lott and Chilton, make a total of nine XY Dial installations in recent months.

President W. G. Winters has prudently guided his company in a steady upward cycle. The 10,000 subscribers served by his company heartily attest to that fact.

Farther south at Needville, the Fort Bend Telephone Company has converted its second largest exchange to 300-line XY Dial. Subscribers at the larger Katy, Texas, exchange have been enjoying a similar system since 1957.

Fort Bend Telephone president Francis Butler immediately put his newly constructed physical plant to good use. The modern business office features a customer-catching color telephone display which is sure to appeal.

In addition to providing Needville subscribers with improved service, the new installation will increase their safety. An XY Fire Alarm System has been incorporated into the equipment and will speed fire communications.

The hustling town of Lolita is located near the Gulf Coast in the Lavaca Bay area. Mrs. Vicena Green is owner-manager of the LaWard Telephone Company, which controls the Lolita exchange.

Alert to changing conditions, Mrs. Green replaced the Stromberg-Carlson "B" type XY Dial system with the more flexible Selector XY Dial system. The new system will handle the increased traffic flow more efficiently.

The displaced "B" system wasn't out of work long. It was quickly transported intact to the Port Alto-Olivia area, where the LaWard Telephone Company has just completed a construction program.

Ready for the cutover at Needville are, from the left, Leslie Green, Fort Bend Tel; Charles Fogg, Carl Price and John Godfrey of Stromberg-Carlson; John Collender, Fort Bend Tel.

Each of these men played a major role in bringing XY Dial service to Lott, Texas. From the left, William Whitlow, Stromberg-Carlson; W. T. Connatser, plant manager; Jim McBride, REA; J. B. Swink, commercial manager; Bob Stagg, asst. commercial manager; Seaborn Lipsey, asst. vice-president; F. G. Winters, vice-president.

Color telephone display brightens attractive business office at Needville, Texas.

Dial 10 — Henderson to Anywhere

Mr. and Mrs. Hershel Trumbo, left, and Mr. and Mrs. William Urga seem pleased with the new XY Toll Ticketing service. Mr. Trumbo is president, Mr. Urga, secretary-treasurer, of the Henderson Telephone Company.

Richard Pryor, engineer of the Henderson Telephone Company, explains operation of the toll ticketing readout equipment to interested guests.

Ralph Smith, Stromberg-Carlson service engineer, discusses the toll ticketing setup with Mr. and Mrs. Richard Pryor.

Twelve miles southeast of Las Vegas, two men gambled on an area that experienced hunch players would shy away from. The odds were long; the payoff looked small. But the two men tried anyway. They won, and so did everyone who uses a telephone around Henderson, Nevada.

Installation of Stromberg-Carlson XY Toll Ticketing equipment by the Henderson Telephone Company is the latest chapter in a story that makes Cinderella seem like the gospel truth. Hershel Trumbo, president of Henderson Tel, and his partner, Bill Urga, are the men who gambled and made the forgotten town of Henderson an important gear in the national telephone machinery.

Just after World War II, a large government project ended and people started moving out of Henderson. Factories, homes, and the only telephone service, a PBX, became the property of the state. Hershel Trumbo and Bill Urga, formerly employed by the project, were among the few who maintained faith in the area. They acquired the telephone franchise — a none-too-valuable asset with more lines than people.

The two men spearheaded a drive that brought people back to fill empty homes; publicized the abundant cheap electric power from nearby Hoover Dam and lured industry into the idle plants.

Population reached twice what it was during the war boom, making Henderson the state's third largest city. The telephone company was swamped with requests for service. To handle the load efficiently XY® Dial equipment was installed.

Now another forward step has been taken — nationwide DDD.

Stromberg-Carlson at Squaw Valley

Their names weren't on the program, but Stromberg-Carlson had a pair of representatives in every event of the VIII Winter Olympics at Squaw Valley last February.

Two Stromberg-Carlson communications products helped make the games more enjoyable for spectators and athletes alike. To keep everyone well-informed, officials relied on a sound and public address system that completely covered the 6000-acre Olympic area, and on Pagemaster® an electronic paging system able to reach key men at an instant's notice — no matter where they were in the Valley.

This highly flexible communications system played a vital part in making the 1960 Olympics the best ever held.

Doctors, rescue teams and other key executives at the Olympics kept abreast of all events with Pagemaster, Stromberg-Carlson's electronic paging system.

Transmitter
GEORGE B. FORBES, Editor
J. T. LONG, Associate

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U. S. Industrial Chemicals Corp. 32
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Utility Tool & Body Co. 126

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Wilkinson Products Co. 80
Williams Inspection Co., Inc., A. W. 125
Winders & Geist, Inc. 98

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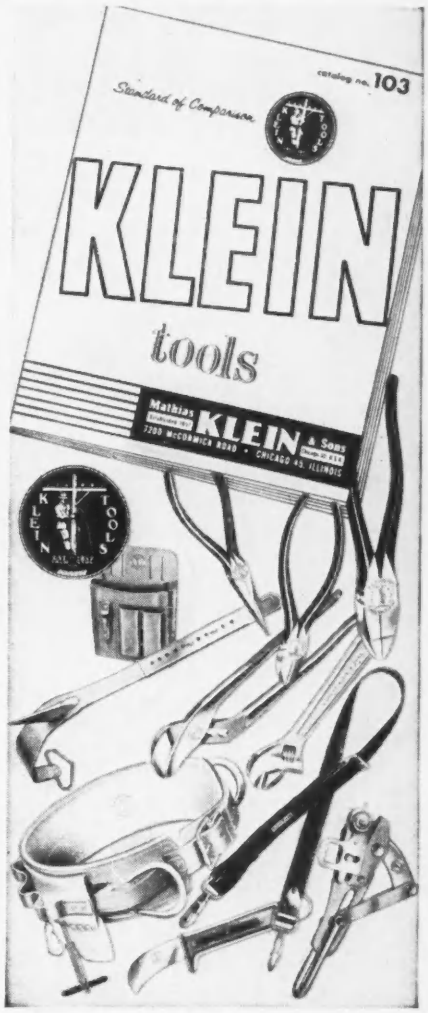
NEW KLEIN CATALOG



Here is the 1960 edition of the Klein catalog illustrating and describing the complete line of Klein tools and equipment for electricians.

It contains many new additions to the Klein line—including Replaceable Gaff Climbers, a newly developed Hot Line Grip and an even wider range of pliers for every purpose.

The Klein Catalog 103 will be of interest to linemen, electricians —good workmen everywhere.

Write for yours.

Foreign Distributor: International Standard Electric Corp., New York.

Mathias Established 1857 KLEIN & Sons Chicago, Ill., U.S.A.
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P.V.C.

...Space-Age Jacket for Modern Phone Cords from COMCO

Today's and tomorrow's demands on your system calls for ever tougher, more durable and trouble free equipment. In cords, that's P.V.C. from COMCO,

Superior to Neoprene in toughness and crack resistance, this P.V.C. (Poly-Vinyl-Chloride) jacketing has other advantages, too. Jacket's smoother inner surface permits conductors to flex freely . . . eliminates binding and fracturing —thus assuring longer noise-free life.

P.V.C. jackets are standard on all COMCO straight cords and Spiraflex Rectractile Cords . . . choice of black or ten colors.

Let COMCO cater to your cord requirements! Handset, deskstand, operator, switchboard, test, patch and inter-communication cords. Standard and extra lengths.

Write for Catalog, Samples and Prices

C O M C O

COMMERCIAL CORD COMPANY, INC.
CLIFTON SPRINGS, N. Y. • HOward 2-2311
Distributed by: LEICH SALES CORP.
427 W. Randolph St., Chicago 6, Illinois
AUTOMATIC ELECTRIC SALES CORP.
Northlake, Ill.

THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Phoning Is Still An Art In India

THE MOST talked-about book in India's capital would undoubtedly be a best-seller, if it weren't given away free. It's the new telephone directory.

The newspapers gave it enthusiastic reviews. The Statesmen hailed it as "a great improvement on the old models." The Hindustan Times headlined it as "handy."

And among Delhi's 31,000 telephone subscribers, the 1960 edition is a conversation piece in government offices and over dinner tables.

The secret of success is the new arrangement of names in alphabetical order. The old directory toyed with that idea; the new one has adopted it zealously. The zoo, for example is now listed under "Z" instead of under "M" — for Ministry of Agriculture and Food — as before.

This shift from the man in his office principle to the citizen in his home has meant less angry shouting at the Enquiry (Information) operator . . .

By dropping degrees, honors, and titles, and holding listings to one line, the new directory has been able to reduce itself from 578 pages to 454, while adding 5,000 new listings. The Chicago directory, about 2 million copies of which are distributed yearly, uses 1,788 pages to list about 1 million names.

Letter Of The Law Invoked On The A's

LISTINGS in the Chicago Telephone directory are not going to begin with A and pile up to AAAAAAAAAA before going on to something else. At least not right away.

The Illinois Commerce Commission last month turned down the request of Sigmund Schy that the Illinois Bell Telephone Co. be required to allow such first position in the book for phone-answering services named in the 10 arrangements of A's.

For being denied the A listings, he threatened to bring a damage suit as soon as he can figure out who would be the proper defendant. He said he had been done out of a wonderful idea.

"If a man thinks of something first," he asked, "isn't that free American enterprise?"

"On The Sick List"

MRS. RAYMOND BURFEIND is reported making a satisfactory recovery from a heart attack suffered last month. Her husband, *Ray Burfeind*, stated Mrs. Burfeind is out of danger and "doing nicely." She is at St. Luke's Presbyterian Hospital, Chicago . . . *Ralph E. Rathman*, assistant sales manager of the telephone division of General Cable Corp. had a lot of explaining to do to his many friends at the Ohio Convention in Columbus. Ralph was on crutches with an ankle in a cast as a result of a fall on the convention floor at Dallas, March 8. The bones are knitting nicely and Rathman reports he hopes to do away with the crutches in another three or four weeks.

SERIES ABS

"Sky-Master"

HYDRAULIC AERIAL BEAM

That's right, with the Series ABS Sky-Master workmen can reach out-of-the-way areas quickly and work on or near energized phase lines in complete safety.

Outer beam of the Series ABS is an extra-strong Spirex tube which withstands dielectric testing far in excess of normal requirements. Reinforced plastic work basket has no current-conducting parts or projections . . . provides ample work space and toe room for the operator.

Control levers beside work basket are connected to those on the mast by direct linkage, giving the operator a positive "feel" not possible with secondary hydraulic control-actuating systems.

Dielectric, reinforced plastic rods are installed in the control linkage and basket leveling mechanisms to electrically isolate the basket from the ground.

Modern way to work on energized high voltage lines

The Series ABS is fully-hydraulic in operation, powered by a pump driven by a power take-off on the truck transmission. Outer beam movement in an operating arc of 270 degrees and inner beam movement through a 110-degree arc is independently controlled. Mast can be rotated continuously in either direction. Safety devices prevent unwanted movement when controls are in neutral or if hydraulic system is damaged.

Maximum ground-to-basket floor height is 42′—enabling men to work safely and without fatigue up to 47′ above ground. Wide range of operation permits spotting of the work basket in limitless positions in any direction from the truck. The Series ABS, installed on a Powers-American Body that fits your work needs, can be furnished in two models; Series ABS-1-42 having one basket, Series ABS-2-42 with two baskets.

Another reason why
UTILITIES EXPECT MORE FROM

POWERS American

UTILITY BODIES AND EQUIPMENT

For descriptive literature and price information write . . .

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5525 S.E. 28th Ave., PORTLAND 2, ORE.

Let our "Revenue Men" show you

THE MEANING OF DIRECTORY COOPERATION!

Take a man like

Arvel Phillips

Arvel is one of our "revenue men" in Herrin, Illinois.

He attended Southern Illinois University in Carbondale, and later served as principal of the elementary school in Benton, Illinois.

After a hitch in the Coast Guard from 1942 to 1945, Arvel returned home and began his career in sales.

It was in 1952 that he joined the General Telephone Directory Company as a sales representative in our Herrin Unit. In 1954, he was promoted to supervisor.

He, his wife and his 13-year-old son make their home right in Herrin. When Arvel is not working, he spends most of his time outdoors. His hobbies are baseball, golf, boating, hunting and fishing. He puts his sports knowledge to good use in his work with the Boy Scouts, home town boys' baseball teams and Church youth groups.

Arvel Phillips is a good example of the "revenue men" who work for General Telephone Directory Company and for you. Men who are an asset to any community in which they live.

You get more than extra sales when you put one of our "Revenue Men" to work on your directory.

His manners, his methods will be a positive credit to your company. He'll be welcomed by your advertisers.

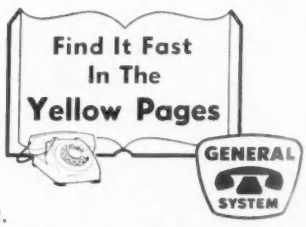
He'll work together with you to produce a book you can be proud of. A directory with complete Yellow Pages service—showing the public where to go for all kinds of purchases, rentals and services. A directory with maximum accuracy, maximum revenue.

And you won't have a worry in the world. Selling, publishing and printing are all done to perfection as part of our Complete Directory Service Plan.

Want to know more about it? A phone call or letter to our nearest office will bring a representative on the double.

GENERAL TELEPHONE DIRECTORY COMPANY

1800 Oakton Boulevard
Des Plaines, Ill.
VAnderbilt 4-2164



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